

DragonflyTV GPS: Going Places in Science
Study of Collaborations between Museums and Media

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Executive Summary

DragonflyTV *GPS: Going Places in Science*

Study of Collaborations between Museums and Media

Introduction

As part of the Summative Evaluation of the DragonflyTV *GPS: Going Places in Science* series, between July 2005 and November 2006, RMC Research conducted a study of the collaboration between the DragonflyTV (DFTV) production staff and its science center and museum partners. Central to the innovative DFTV series, the collaboration involved museum professionals in the production process and presented science museums and centers as sites of learning and of fun on national television. It also offered professionals in the two industries a ground-breaking opportunity to learn about another format for informal science education.

More than a single collaboration, the experience involved fifteen unique partnerships, between DFTV's consistent and relatively small content and production staff and the staff of fifteen diverse informal learning institutions. Thirty-three people, including educators, curatorial and public relations staff in the partnering institutions and DFTV staff members, were interviewed for the study. Baseline and final interviews were conducted to capture both initial expectations about the collaboration and ideas about learning in informal science education venues, and to collect actual collaboration stories and reflections on participant learning.

Findings

Building a Successful Collaboration

The study presents a number of findings related to conditions necessary for and challenges of building successful media-museum partnerships. These related to building effective communication strategies, recognizing a shared mission, and clearly articulating the roles and responsibilities of the partners. In addition to these universal elements of successful collaborations, a number of concerns specific to the museum and media work cultures and environments also emerged. While many of these findings would be true in any cross-industry collaboration, others are unique to how televisions and museums work. Selected observations included:

- Recognizing that the two sets of partners shared a common mission was crucial in building trust and understanding, and in allowing these quickly-established and intense partnerships to move ahead.
- On other media projects, museum staff had typically not been asked to review rough cuts. This stood out as an indicator of how engaged they became in the collaboration.
- The very different timelines along which museums and television produce their products was a source of tension between partners.
- Partners on both sides of the collaboration often began with little understanding of the other institution's organizational structure or the roles and relationships of different positions within the organizations.

- The very different uses of the term “interactivity” in the television and museum worlds initially impeded effective communication.
- Television thrives on having access to diverse experiences, but capturing these sometimes meant confronting and accommodating museum rules and regulations.

Outcomes

The study also presents findings related to the outcomes of the collaboration, including museum and television partners’ appraisals of the value, quality, and potential use of the science inquiry segments produced through the collaborations, and the cross-industry learning which resulted from the process of collaborating. Some of the findings related to outcomes included the following:

- Museums were unanimously enthusiastic about the final products, although in some cases publicity value was a factor in their assessment of the overall product.
- DFTV staff demonstrated a growing understanding of museum staff desires for establishing the uniqueness of their institutions and covering specific exhibits or features of their institutions.
- Museum staff looked forward to using their segments for both educational and marketing ends.
- Museums were particularly happy with the segment’s value in giving them national publicity and recognition. They saw potential marketing value, but they varied in their success leveraging the segment for local publicity at the series’ premiere.
- DFTV’s inclusion of inquiry both in the museum and outside the museum walls inspired several of the partners. Many of the museum educators were particularly enthusiastic about using DFTV as a model and inspiration for linking their institutions to real-world concerns and investigations.
- Discussions with the museum educators illuminated some points of overlap in what television and museum education can achieve, as well as opportunities for complementing each other.
- Television can provide non-local experiences, present in a few minutes processes that occur over long periods, and reach large audiences.
- Museums are more adept at providing opportunities for longer term learning and showing the messiness of actual investigations.
- In a few cases, the collaboration inspired reflection on media use within museums.

Conclusion

The collaboration study examined fifteen different collaborations between DFTV’s consistent and relatively small content and production staff and the staff at fifteen different informal learning institutions. The “one-to-many” structure of the project allowed DFTV staff members to use the experience gained in one collaboration to inform their work with the next, while each set of museum partners experienced the collaboration as a one-time event.

Individual participants from both sets of institutions entered the process with varying knowledge of informal science education and of work in one another’s fields of education

(television or museums). For instance, DFTV's content and senior staff had a good grasp of science education concepts, while production staff members were relative newcomers to the field. Museum educators also ranged in the depth of their experience in science education and inquiry-based learning, and represented institutions with different histories and emphases, such as research or hands-on experiential agendas, different content areas. They also brought very different levels of experience with television production or with the media more generally to the partnerships.

While DFTV staff shared a fairly narrow view of science education, as shaped by the agenda for DFTV *GPS* segments, and more broadly through excluding consideration of other audio-visual formats, from radio to iPods to IMAX films, museum educators were often involved in a range of experiences, from exhibits to after-school programs. DFTV staff originally approached the museums intending to focus on a particular exhibit, assuming that this would be the logical fit for a DFTV inquiry segment, but over the course of the season realized the need to explore the range of museum experiences which might be applicable to a science investigation story.

Despite the very different starting points and the fact that DFTV was clearly the lead partner, the collaborations were overall judged a great success. Only one potential partner backed out after preliminary discussions, and DFTV successfully accommodated the needs of fifteen different institutions. The result was a set of highly individual science investigation segments that incorporated the science center as a source of content or starting point for a broader investigation. Museum partners were ultimately very pleased with their segments, including the representation of the institution and of the science. DFTV staff felt that working with these partners opened their eyes to new content that they would not otherwise have considered for the show. Creating a direct link to museum exhibits lead the producers to new types of investigations and storylines. The resulting investigations range from the design of a doghouse to the creation of an art installation, which expanded the format that had been applied to earlier seasons of the series. The segments portray museums as fun places for gaining knowledge in science, applicable to a range of interests and endeavors.

The collaboration also "pushed the envelope" on DFTV's earlier approach to inquiry. Although some of these segments were more challenging to produce from the DFTV perspective, they were also among the most innovative.

A significant lesson DFTV learned over the course of the season was an expanded range of strategies for partnering more effectively with museums and their various departments. Collaboration participants had to meet a number of challenges, both those that are common to all collaborations, such as articulating shared goals and clarifying roles and responsibilities, and those that were unique to these partnerships, such as tensions between educational outcomes and publicity considerations (likely to arise any time the media are involved) and the unique uses of terms ranging from "casting call", to "inquiry-based" and "interactivity".

All participants gained exposure to and a new understanding of work conducted in another arena of informal science education. Museum staff learned that not all television productions are the same, and expanded their understanding of the kinds of science learning experiences which television can offer. The TV producers broadened their

understanding of learning in museums, and expanded their sense of what “scientific inquiry” can mean. In many cases, the collaborations also occasioned reflection on practices within each profession. The DFTV were able to quickly integrate their experiences and reflection into the next round of stories and partnerships, while museum professionals will take the lessons they learned back to their institutions, a diffusion which will happen more gradually and will be harder to document decisively.

Each set of partners learned about the other—their work cultures, the media they work in, and their points of continuity as informal science educators. They also expanded their own visions of potential learning experiences, and developed a better understanding of how to work in media-museum collaborations in the future. But perhaps most important, the collaboration opens space for a new dialogue about strengths, limitations and potential for informal science education in different settings.

Introduction

In spring 2005, RMC Research contracted with the producers of DragonflyTV (DFTV) at TPT, Twin Cities Public Television, St. Paul to conduct a summative evaluation of a new set of episodes produced with science centers under the title DragonflyTV *GPS: Going Places in Science*. The evaluation plan comprised two distinct parts: a study of the collaboration between science center and television personnel in producing the *GPS* series, and a study of children's responses to the segments. This document is the final report of the collaboration study.

DFTV is a half-hour science series, now in its fifth season on PBS. Its format is simple: Real kids doing real science. The series does not feature child actors or adult presenters; it captures ordinary kids doing their own science investigations and showcases them in fast-moving videos with popular music soundtracks. In their own voices, kids tell how they pursued their investigations and communicate the infectious excitement that comes with making their own discoveries.

Unlike other science shows for kids, DFTV is not a collection of facts: It's about the scientific process. In every segment, children pose questions, design and conduct experiments, gather data, analyze that data, draw their own conclusions, and pose further questions, an approach based on the "full inquiry" model recommended in the National Science Education Standards.

Each episode in the *GPS* series explores a different city and follows children as they visit science centers or science museums. Each activity typically consists of two parts: the children begin their investigation at a museum exhibit, making observations and asking questions, then continue their investigation or a related activity outside the museum.

This study addresses the first series of *GPS* programs which aired on PBS as season five. A second series of *GPS* programs with other museums is in production and will premiere in April 2007.

The innovative design of the *GPS* series brings together two groups of informal science educators—television and museum professionals—in a unique collaboration. While television productions have frequently collaborated with museums to create and distribute outreach materials, and news crews often shoot journalistic pieces at museum sites, the DFTV collaboration uniquely a) engages the resources of both sets of professionals in the show's production, and b) presents the museums on the television program. The goal was not only to produce rich informal science education materials that feature science centers and museums, but to provide a professional development opportunity through which the two sets of professionals could further their understanding of informal science education and the value of diverse formats for learning.

Evaluation Goals

The study aimed to understand the collaboration's success both in producing science television segments and in creating a professional development opportunity through which informal science educators working in television and museums could expand their own understanding and practices in science education. It was hoped that collaborative process would engage informal science educators in learning about other modes of

science communication and understanding how different media and experiences can complement each another.

Methodology

In order to draw out underlying approaches to their work, understand perspectives on informal learning, and measure the collaboration's success, RMC evaluators conducted in-depth telephone interviews with project partners throughout the production process, speaking with television production personnel, the museum educator or curator most closely involved in the story development at each participating institution, and the museum public relations or communications person involved in the DFTV shoot and/or museum events that took place around the premiere of the programs.

Baseline interviews were designed to occur before shooting at each institution; final interviews were designed as a culminating reflection on the overall experience. Final interviews with education staff took place immediately following the review of the rough cut of the video segment, while final interviews with public relations staff took place after the segment's local broadcast.

Thus baseline interviews were conducted with all participants between September 2005 and January 2006. Final interviews were conducted in three waves related to the subjects' production roles: DFTV production personnel were interviewed at the completion of production, between April and May 2005; museum educators were interviewed between January and May 2006, and public relations personnel were interviewed between May and August 2006. Broadcast dates in New York and California had still not been set at the completion of study interviews, and therefore public relations personnel at these institutions were not contacted for final interviews.

Participants

A total of 27 museum and six television professionals participated in interviews. Although the original intent was to interview each participant twice, in some cases a different staff person became more involved with the production following the initial contact; that person was interviewed in the second round. In a few cases, the interviewees were no longer at the institution, unavailable, or not interested in participating in the study. In some cases, a single person spoke for all aspects of the collaboration at an institution.

Table 1 shows the total number of interviews conducted during each stage, by professional role.

Table 1
Study Participants

Institution	Title	baseline	final
Aquarium of the Pacific	Public Programs Manager	x	x
Aquarium of the Pacific	Manager Media Relations	x	*
Arizona Science Center	Director of Education	x	x
Arizona Science Center	Director of Marketing		x
Arizona-Sonora Desert Museum	Education Specialist		x
Bakken Museum	Senior Science Educator	x	x
Bronx Zoo	Curator of Education		x
California Science Center	Deputy Director of Education	x	x
California Science Center	Assoc. Director of Communications	x	*
Carnegie Museum of Natural History	Director of Education	x	x
Carnegie Museum of Natural History	Director of Marketing	x	x
Carnegie Science Center	Chief Program Officer	x	x
Carnegie Science Center	Director of Marketing	x	
Discovery Place Ft Worth	Director of Visitor Experience	x	x
Exploratorium	Senior Staff Scientist	x	x
Exploratorium	Advertising and Promotion Mgr		x
Ft Worth Museum of Science & History	VP and Curator of Collections		x
Ft Worth Museum of Science & History	Director of Public Affairs	x	x
Lawrence Hall of Science	Earth Science Specialist		x
Lawrence Hall of Science	Marketing Manager	x	
MN Zoo	Education Programs Supervisor	x	x
NY Hall of Science	VP for Education; Science Instructor	x	x
NY Hall of Science	VP Public Programs & Special Events	x	*
Science Museum of MN	Mgr. of Promotion (education)	x	x
Science Museum of MN	Director of Communications and PR	x	x
DFTV Production Staff	Researcher	x	
DFTV Production Staff	Associate Producer	x	x
DFTV Production Staff	Associate Producer	x	x
DFTV Production Staff	Senior Producer	x	x
DFTV Production Staff	Producer	x	x
DFTV Production Staff	Science Content director	x	x

* no air date in this market

Participating Institutions and Segment Descriptions

The participating institutions and DFTV segment to which they contributed are organized below by city or region.

Dallas – Forth Worth

Dino Dig (Fort Worth Museum of Science and History): Kids investigate the dinosaurs and other creatures that once lived in the Dallas-Ft. Worth region, comparing macroscopic and microscopic fossil evidence.

Baseball (Science Place, Dallas): Using an apparatus that tests baseball bats, two young scientists investigate how the size and shape of a baseball bat affect the location of the “sweet spot.”

Los Angeles

Bottom Feeders (Long Beach Aquarium of the Pacific): Kids study several varieties of bottom feeders, comparing the creatures in the aquarium with those in the wild.

Sailing (California Science Center): Beginning in the “Big Lab” exhibit, kids test sailboat models and use their findings to determine the most efficient sailboat design.

Minneapolis – Saint Paul

Music and Sound (Science Museum of Minnesota, Saint Paul): After being inspired by the sights, sounds, and rhythms of the IMAX movie “Stomp,” kids visit the museum’s sound exhibits to explore the relationship between materials, shapes, and sounds, and use what they’ve learned to create their own musical instruments.

Prosthetic Arm (The Bakken Museum and Library, Minneapolis): A girl with a myoelectric prosthetic arm explores how the electrical signals in her body help her arm function by conducting experiments with a new “body electricity” exhibit.

Animals and Smell (Minnesota Zoo, Apple Valley): Beginning at the “Animal Grossology” exhibit at the Science Museum of Minnesota, kids investigate how zoo animals depend on their sense of smell.

New York

Luge (New York Hall of Science): Junior lugers from the United States Luge Team investigate gravity on the slides at the New York Hall’s Science Playground and apply what they learn to maximize their luge timings on the track at Lake Placid.

Biodiversity (Bronx Zoo): Kids check out the Bronx Zoo’s Congo Gorilla Forest to see how plants and animals coexist in the layers of the African Rainforest.

Phoenix – Tucson

Dog House (Arizona Science Center): Two girls learn about construction techniques at the Arizona Science Center’s “Many Hands Make a Home” exhibit, trying out what they learn on a house for their dog,

Cactus (Sonora Desert Museum): Two docents at the Arizona-Sonora Desert Museum explore the homes birds build the Saguaro cactus surrounding the museum.

Pittsburgh

Bog People (Carnegie Museum of Natural History): Kids investigate why bogs help keep organic material from decaying and view the preserved, prehistoric humans in this traveling exhibit.

Roller Coaster (Carnegie Science Center): Two young scientists design their own rollercoaster, test it on a simulator, and finish their investigation on “Phantom’s Revenge,” a roller coaster at a nearby amusement park.

San Francisco

Earthquakes (Lawrence Hall of Science): After a visit to an exhibit showing how geological forces formed the San Francisco Bay, two girls investigate the major fault lines passing through San Francisco.

Light and Color (Exploratorium): A team of young scientists creates an interactive art project, starting with experiments in the museum's "Light and Color" exhibit.

Instruments

The baseline interviews were designed to gather preliminary data on the museum and television partners' understanding of science education concepts such as inquiry and interactivity, perceptions of science education in the television and museum contexts, and information on the expectations and dynamics of the collaboration. A single protocol, with different questions for each category of interviewee, was designed.

The final interviews were designed to capture changes in knowledge or attitudes about informal science education as a result of the collaboration and information on the project's perceived value.

Interview protocols appear in Appendix A.

Analysis and reporting

All interview data were entered into Atlas.ti for content analysis.

A preliminary report based on findings from the baseline interviews was submitted to DragonflyTV in November 2005, and preliminary findings from baseline and final interviews were presented orally at the DFTV advisor's meeting in September 2006, followed by a slide presentation at the ASTC meeting in October 2006. The baseline report and slide presentation appear in Appendix B.

Findings

Collaboration Participants

DFTV and museum participants began the project with varying knowledge of one another's work and of informal science education more generally. Senior DFTV staff and museum/science center staff generally had extensive backgrounds in informal science education, while other members of the TV production staff were largely newcomers to science.

Museum staff varied from institution to institution in their prior experience with television production. Although the DFTV staff began with wide differences in knowledge and experience of science museums, as a group they learned throughout the collaboration, integrating their experiences with one museum into the approach and collaboration they applied to the next.

DragonflyTV staff brought an approach to their work that had been established in the series' previous four seasons. It included a particular definition of inquiry and a preference for kid-friendly, action-oriented science investigations, such as sports-related investigations. Large-scale activities and visual interest were also important criteria the producers brought to the process of developing stories and selecting exhibits to be televised.

By contrast, each of the fifteen museum partners had their own institutional conventions regarding inquiry, exhibits, and practices for dealing with the public. The findings that follow illuminate the differences in the two industries and provide important lessons for future collaborations.

What Makes for a Successful Collaboration?

Baseline interviews revealed general agreement across both fields about the requirements for successful collaboration—shared goals, equal commitment, sufficient resources, and understanding of partners' work processes. However, interviews about the complex process of creating a television segment in close collaboration with museum staff revealed numerous challenges.

Recognizing a shared mission

Recognizing that the two sets of partners shared a common mission was crucial in building trust and understanding, and in allowing these quickly-established and intense partnerships to move ahead.

The first challenge DFTV staff faced was in communicating exactly what kind of media they intended to produce. Their early successes in this effort varied; some institutions initially saw the project as journalism or documentary rather than as a science education endeavor. To some degree, this challenge diminished if initial contact was made with the institution's head. Public relations departments, to whom the DFTV producers were often directed because of the format of their work, posed frequent barriers. DFTV staff noted that sometimes it came down to selling potential museum partners on the idea "that we are doing the same thing," and that it was "really hard to convince those for whom DFTV is not [broadcast] in their market." From the museum perspective, the partnership entailed

“not a lot of money, but a lot of time.” (Each museum received a stipend of \$8,000 to cover their staff costs and expenses.) DFTV staff saw the challenge as conveying the idea that “it’s just the right thing to do—a teaching moment,” and something which they felt should resonate with the institutional missions of their partners, “it’s about kids learning science.”

Some partners embraced the sense of a shared mission—“It was a way to carry out our mission”—immediately, and all eventually came to understand the project’s collective value. Museum educators described this mission variously, noting for instance that both professions focus on “making science fun, and relevant, and making connections in everyday life,” and on motivating and engaging students. Another educator described her organization’s mission as being about “instilling a sense of wonder and respect for the ocean,” and saw DFTV as one more means to that end. Others saw not only the common mission, but the opportunities to complement one another’s work: “Working with DFTV makes incredible sense with everyone involved. We have a shared audience, and can complement each other’s audience base. We have a great audience to introduce to DFTV, and DFTV has a huge audience and can bring real live experiences at the science center that can be done at home.” Museum partners saw DFTV’s presentation of the science museum as “a cool place to go” as valuable recognized the opportunity DFTV offered to raise awareness of the value of museums nationally. Some museum partners noted that the show targets teenagers, a particularly difficult audience for museums to reach.

Museums recognized a number of other potential benefits for their institutions, including driving audiences to their doors through local and national publicity, and in some cases, boosting their reputations.

Many institutional partners saw the collaboration as an opportunity to be involved in a cutting edge project. As one museum participant explained, it was important to “be able to say we worked with DFTV and it was great;” it gave them an opportunity “to set an example of media collaborations for other institutions.” Others said that in addition to gaining local and national recognition, their own reputation would benefit from collaboration “with a respected educational organization.” Some looked to the show as a means of driving viewers to their doors: an educator noted, “my hope is we get kids who might not otherwise visit a living museum [zoo or aquarium].” Others saw the collaboration less as an opportunity for increasing visitor numbers and more for “portraying our museum as world class.”

A few museum educators looked forward to the show’s value in expanding museum offerings, recognizing that for their audience “You have to keep it new, and keep looking at what other kinds of educational experiences they have.” DFTV’s style was particularly appealing, explained one educator, because not only did the show “fit right in with our inquiry belief and educational style,” it is “going to enhance our image.”

In some instances, it was not clear how participating in a DragonflyTV segment would meet a museum’s public relations goals, and this uncertainty created tensions between the museum’s public relations staff and DFTV staff, and, between public relations and education staffs in the museum.

Recognizing the opportunity for publicity, some public relations personnel had difficulty keeping the collaboration’s educational goals at the center, reverting to a common

concern about controlling how the media would represent the museum to the public. One public relations person spoke frankly about her attitude toward the media: “Primarily we want pieces that represent the museum well and generate ticket sales. If it does neither of those things, it’s unsatisfying... We are responsible for the integrity of the brand ...Part of our job is to make sure the museum itself is the story.” In some cases, public relations staff sought to control what would be filmed and how, and DFTV struggled to gain the trust necessary to fulfill its mission. The most dramatic example of this was ostensibly the product of a miscommunication between DFTV and museum partners over the meaning of the term “open casting call.” When DFTV placed an advertisement for children to come to the museum to audition for DFTV, the museum administration felt DFTV had overstepped its bounds, and withdrew the museum from the partnership. DFTV staff learned from this experience and modified the audition process with subsequent partners.

Museum partners recognized the value of the collaboration in contributing to the field of informal science education through sharing materials and building networks.

A number of education partners in particular saw the collaboration as having value beyond DFTV and their own institutions, by contributing to the larger field of informal science education. They pointed to both the episodes and the educator’s materials as valuable resources for other museums. “It’s possible that someone [in another museum] might see this and think, ‘Wow, I didn’t think of that,’” explained one educator. While some highlighted the value of the television episodes, noting that small museums “can show them to after-school kids to provide enrichment, and families can experience things together,” others saw greatest value in the educational materials, noting that small museums cannot produce the kinds of materials possible through a collaboration such as this. The collaboration’s value, noted one educator, was in “maintaining our network with other non-traditional education venues and having an open dialogue. It is important to keep the whole community connected and moving forward.”

In addition to building relationships with other institutions, museum staffs saw value in developing relationships with their local PBS stations, saying, “We’re eager to find new ways to collaborate with media. Public TV is a good way for museums to do that...So I think it’s open-ended right now where this can go.” Some observed that the collaboration could help them build such ties, so that “if we want to advertise, we know that we can contact our local media.”

DFTV staff recognized the value of these relationships as well. One staff person noted, “It’s always been good for DFTV when we establish a trusting relationship with another educational institution.”

Establishing clear roles and responsibilities

Much of the tension, particularly before shooting occurred, arose from a lack of clarity about each partner’s roles and expectations.

Because this was the first season focusing exclusively on science centers, DFTV staff were working “on the fly” to define how the partnerships should work: “We were figuring out, as the season progressed, what level of collaboration was needed—how

much content was tied to the museum, how much we needed access to their facilities. For us, we don't usually bring in outsiders, so this was a lot," explained a producer. Ultimately, the DFTV staff recognized that the science investigations "couldn't have been done them without [the museum partners]." Describing the partnerships' value for DFTV, a producer said, "I always felt I had an ally in the museum. They would test things for us—run the investigation or get data. And from my experiences they were all able to do that. They all brought ideas to the table of what made it a better segment." At the same time, partners on both sides recognized that the final video segment remained under DFTV's editorial control: "They are definitely collaborators on content and how the museum is represented, but in the whole overarching story, they don't have full say," explained a DFTV producer.

In the end, the level of museum participation—in both story development and on-site support during the shoot—varied with each relationship.

Ultimately, museums varied in the depth of their contributions to the episodes, from charging the entire education staff with identifying potential story ideas and building a customized exhibit, to more minimal involvements such as providing information about an exhibit and reviewing scripts and rough cuts for content.

Some educators found they did more than they anticipated; "It ended up being a heck of a lot bigger than expected," one said. In some cases they collaborated on several versions of the script, offering feedback on the science content for each iteration. One educator said that at the time she thought, "Again? We have to do it again?" but realized that "they didn't know the content [and we did]." In contrast, others felt they did much less than expected: for example, "All we needed to do was come up with the content and review the draft, including editing scientific names. They do a lot more of the work that I initially thought I'd be doing."

Museum staff varied as well in their expectations of their roles leading up to and during shooting. While some noted the extensive questions and communication before the shoot or the long days of the shoot, others were prepared for greater involvement. For instance, one educator felt that she spent much less time than she expected. "They told me to be on call for the week before shooting, but I was needed very little. While they were here, they were very self-sufficient, except for the sound guy whose batteries didn't work." While another museum partner noted it was "a very enjoyable experience and he would like to work with DFTV again," he advised others to plan on filming taking longer than expected. He had planned on four hours instead of eight and noted, "things sneak up on you."

By the end of the season, DFTV staff reached a clearer sense of how they saw the role of museum partners, i.e., primarily as science content and facility experts. Museum partners were largely comfortable with their role as content and location advisors and felt their opinions were respected.

Most media partnerships with which museums had been involved did not have DFTV's intense science-inquiry and content objectives. This meant that the DFTV partnerships placed significant responsibility on the museum educators to provide content expertise. Museum staff who understood their roles as content experts—rather than as producers—were most satisfied. In that context, most felt their expertise was valued: "They let us be

experts in our stuff. We let them do the video editing.” Others said, “They were legitimately interested in what we had to provide them,” and we “saw ourselves as supporting [the DFTV crew], while we were the experts in our little field.”

Overall, museum partners were very pleased with the roles they were afforded. One explained that the project “was more DFTV than the [museum]. As it should be, they got to make the calls, but they listened. They went back and forth more than other TV crews.” Another described the relationship as “symbiotic” and explained, “We were happy to receive their creative ideas and they were receptive to ours. We helped with logistical efforts, as they did with casting...I never felt like I was not able to provide enough. And they were accommodating to my requests.”

On other media projects, museum staff had typically not been asked to review rough cuts This stood out as an indicator of how engaged they became in the collaboration.

Several museum partners commented on the degree to which DFTV staff looked to them for content ideas and input. They were particularly impressed, and even found it “refreshing” that they were asked to review the rough cut of their video segment. From the DFTV perspective, it was a challenge to figure out at what point to ask museum partners for their feedback. If it was too early in the process, the reviewer would be distracted by the unfinished audio and missing graphics. However, showing a later version made it more difficult to incorporate changes. DFTV staff members held firm limits on what they were willing to change: they would change voice-overs and even graphics to clarify science content, but were not willing to consider changes in the storytelling style.

Sorting out the responsibilities for casting was an early stumbling block in some partnerships.

DFTV features ordinary kids who are selected for each investigation through an audition process.¹ Misunderstandings about the casting roles and responsibilities created tensions in some relationships. In some cases, museums wanted to reward specific students for their involvement in museum programs, and to varying degrees moved ahead with selecting and/or preparing these children for the shoot. As a museum educator explained, “We were disappointed because we wanted them to use some of our after-school children or others in the area, but that didn’t work out.” Production staff came to understand that they needed to be very clear about who would take the lead role in casting.

While DFTV staff held fast that they would be in charge of casting because of the importance of choosing children who would be engaging on television, most of the museums were invited to assist with the casting call. This was a mixed experience for museum staff, who in some cases found it took much longer than expected, and in other cases found it stressful.

Museum and DFTV staff agreed that the museums’ flexibility made for a smoother experience for all.

Several museum partners noted the need to be flexible. Because plans can change so quickly, or situations like dead batteries emerge, they found they needed to be ready to accommodate the film production crew. DFTV staff concurred, noting that television

¹ Because of union restrictions, children who are professional actors cannot appear on DragonflyTV.

requires flexibility. A change in weather can prevent filming outdoors, rearranging the shooting schedule. DFTV staff applauded one museum educator who arranged to make an exhibit hall available to the crew at the last minute when rain postponed an outdoor shoot. A museum educator explained, “if I was one who wasn’t willing to be flexible, it would be disconcerting. It would have been great to have planned it out months in advance, and we could have prepared things. Instead we are just going with it. But of course, I’m a teacher, so I just go with it.”

Each museum received approximately \$8,000 to cover staff costs. Although this partnership fee did not in most cases cover the museum’s actual expenses, it was seen as an important gesture on the part of DFTV, particularly when coupled with other benefits.

Although some called the partnership fee “generous,” most felt it was not enough to cover the actual hours spent on the collaboration. Knowing they would receive some financial award for their work made it easier for some partners to collaborate, despite ambiguities about their actual role. One museum partner said that “knowing there are some dollars up front made it easy for us to say sure, ‘let’s give this a shot.’”

Despite knowing that the partnership fee would likely not cover all of their time on the project, the museum partners were all comfortable with the arrangement because they felt the publicity was worth it: “We went into it knowing we would do more work than we were paid for, but that’s the value of publicity and getting core ideas exposed to a lot of people,” said one. Another museum partner agreed that “it’s pretty modest, but balanced with the public relations impact, it’s great.”

One museum educator interviewed had represented a third institution in one city included in the show and, as a partial rather than full partner, was not offered the partnership fee. This was a source of some irritation, as staff nevertheless felt they were asked to participate as other partners in many of the aspects of the project, such as the evaluation.

Aligning Work Cultures and Expectations

Baseline and final interviews suggested a number of key differences in the two industries’ work cultures, which created consistent challenges for the collaboration.

The very different timelines along which museums and television produce their products was a source of tension between partners.

The two industries generally follow very different timelines in creating science education content. Museum personnel are accustomed to long-term planning and slower turnaround times: An exhibit project may take three or more years. In contrast, television production happens relatively quickly, and much of the long-term planning occurred long before museum partners were brought into the project. (The entire DragonflyTV *GPS* production period was ten months.) Each segment was produced over a couple months of pre-production, concluding with an intensive week or so immediately prior to the shoot. Shooting for each story lasted between two and three days.

Museum staffs felt it was a “fast-paced schedule” and noted that the turnaround times for the project as a whole and for particular details were much shorter than those they are accustomed to. They received a large number of phone calls and emails, to which the production staff expected a quick response. Because of this pressure, one museum partner

advised future collaborations to “be clear on expectations and deadlines,” and remembers that while museums “allocate resources well in advance,” in television and radio “things happen quickly.” A production staff person explained television as a “minute-by-minute” world, and characterized it as a “think on your feet industry,” with stories changing many times “before lunch.”

The challenge was amplified by the fact that museums were often juggling multiple projects of their own, while DFTV staff was solely focused on these collaborations. In one case a museum staff person explained that even though she had institutional support for DFTV, the project was not perceived as a priority and other projects also needed to be attended to.

Partners on both sides of the collaboration often began with little understanding of the other institution’s organizational structure or the roles and relationships of different positions within the organizations.

While the DFTV production staff working with each institution included a producer, associate producer, crew, and the science content personnel, all drawn from the relatively small DFTV staff, the museum collaboration often involved many departments and people. DFTV staff had to navigate multi-departmental, museum bureaucracies, each unique to its institution. At first, DFTV staff hoped to identify a key contact person at each museum, they realized over the course of the season that each museum staff structure was different. Still, they found it helpful to have a “cheerleader” at each site who could “maintain contact and disseminate information to their people.” A producer explained that the levels of bureaucracy in some of the museums meant delays in getting approval for plans, adding that “after the first couple of episodes, I made it clear that I would need this level of commitment [and access to authority to make decisions] and if they didn’t think they were the person, they found the person who was.”

A DFTV staff frustration was the need to communicate with numerous people in each science center—complicated by the fact that, in some institutions, there is little communication between departments, such as education and public relations. A museum educator concurred that it’s important to have “a single person that all the information is going through, so as to maintain a good sense of what the whole project is about.”

In turn, several museum staff noted that at first they didn’t understand the different production staff roles, and that the introductions made at the partner meeting² were helpful in clarifying the different roles of the DFTV staff with whom they were working.

Production Challenges

Adapting the DFTV format to the museum setting turned out to be more challenging than producers expected. Television and museum partners were drawn into a rich dialogue, through which they learned how to communicate more effectively with one another about their needs, and worked closely and creatively either to adapt existing exhibit museum experiences or create new experiences for the kids on the show.

² In collaboration with the Science Museum of Minnesota, DFTV brought together representatives of each partner museum/science center for a one-day Partners Meeting in September 2005, shortly after production began.

The very different uses of the term “interactivity” in the television and museum worlds initially impeded effective communication.

This challenge was best articulated by a DFTV producer, who explained that in “trying to identify what was an attractive exhibit versus what makes engaging television, the keyword that was causing so much disconnect was interactivity. We use that one way, and museum people use it another way.”

Baseline interviews with museum educators and production staff clearly indicated the different ways they used this term. DFTV staff members held a range of meanings of interactivity, from children’s use of web materials following the show, to what the children are doing in the show itself, and even activities outside the museum walls. The difficulty came in using “interactivity” with museum partners to describe the kinds of activities they sought to capture on video. For instance, production staff cited an investigation involving an amusement park visit featuring a ride on a roller coaster as a model for their desires for action and excitement, describing it as a highly “interactive” experience for the kids in the segment.

Museum educators’ definitions and criteria for “interactivity” were broader, and included “engaged by thinking, looking, doing,” or emphasized an aspect of this, such as “hands-on,” “whole body,” “minds-on,” and “something that produces a response.” Speaking about the zoo environment, one educator described the goal as immersion rather than interactivity, because of the environment’s limitations. Another museum educator spoke of different *levels* of interactivity, and described a good exhibit as one that “engages the senses and requires you to ask questions.” Museum educators approached the notion of interactivity from the perspective of a visitor interacting either with an exhibit or with others in the museum environment.

Further, several museum educators noted that television is not interactive. Some described television as “a one-way medium” that “can never create dialogue;” rather than offering an authentic experience of inquiry, they said, in television “you do it through someone else’s eyes.” They described television as “telling a story about science inquiry,” where the possibility for interactivity depends on reproducing the process at home, with possible support from materials on the Web.

While production staff originally used “interactivity” to describe the kind of experience they wanted to film, during the course of the season they realized that it was not the most appropriate word to describe what they wanted: Terms such as “kid-friendly,” involving “lots of action,” and “very visual” communicated more clearly the kind of engagement they wanted to capture on camera to make a compelling story.

Identifying a museum experience that could form the basis of a DFTV inquiry was another challenge. It revealed the different ways that “inquiry” is defined in the television and museum contexts.

Baseline interviews explored how professionals in each field used the term “inquiry”, which ultimately reveals the wide range of inquiry possibilities and each industry’s strengths and limitations.

DFTV staff was united in viewing inquiry as largely defined by the model developed for the show, itself drawn from the National Science Education Standards definition of “full

inquiry” (National Research Council, 1996). This model included: a context in which the investigation takes place; a clear statement of the research question; a method for investigating—either experimental or observational; an analysis of findings; a statement of conclusion; and the next question of interest. In each major segment of DragonflyTV, the producers set themselves a goal of capturing kids in this full arc of inquiry.

Museum staff varied in their familiarity with and depth of understanding of the range of inquiry experiences. Education staff had ready, if varied, definitions of “inquiry,” while most public relations staff had little involvement in science education topics and did not respond to questions about defining inquiry-based and interactive learning.

Museum educators all embrace inquiry as a question-driven process, but emphasize a range of related ideas in defining the term, including “student-driven,” “creating dialogue,” “leaves the learner asking more,” “the question is more important than the answer,” and a multi-step process such as “engaged, explore, explain, elaborate.” Several noted that the inquiry process starts and ends with questions. In some cases, museum staff noted that definitions of “inquiry” varied even within a single institution.

Several museum educators articulated different kinds or degrees of inquiry, drawing distinctions, for instance, between different levels of inquiry possible in museums such as highly structured exhibits, facilitated or guided activities, and open-ended activities which might produce results outside original objectives. One educator noted that the degree of inquiry in an exhibit depends on facilities and time available, while another spoke of the limitations of inquiry in museums and the need to provide varying amounts of interpretation for an exhibit to be successful.

Speaking of the limitations of “inquiry” on television at the start of the collaboration, several museum educators observed the television viewer is not posing the question, though “hopefully the TV show will pose a question the viewer is interested in.” One museum educator described DFTV’s idea of inquiry as “procedural,” while another contrasted it with the ideas that “inquiry is slow, methodical, and very reflective. It doesn’t work on TV. You can never show thinking, all the possibilities that were considered, or the time that it takes. You don’t get an appreciation of how science works, but you can show how gratifying it is at the end.” In contrast, museum educators’ reflections expressed at the end of the collaboration process suggest that some developed an appreciation for the extent to which video can capture the inquiry experience. Their comments are discussed in a subsequent section below.

Museum educators also noted other assets of museum learning, such as opportunities for group learning and for children and parents to engage in shared inquiry. Several noted the increasingly important role exhibit facilitators play in aiding the inquiry process.

Originally, DFTV staff approached science centers looking to identify a specific exhibit which they could showcase and use as a site at which to begin a science inquiry. In several instances, no appropriate exhibit was readily available, so the producers and the museum staff created an exhibit-like experience in the museum for the children to investigate.

As one DFTV producer explained, the collaboration meant a major compromise in the DFTV producers’ control over story development. Putting location first and story second

meant that “the producers’ sensibilities about what made a good story didn’t matter—they just had to turn it into something,” a DFTV producer said.

From the producers’ perspective, a museum experience which fit neatly into the DFTV model meant a smooth collaboration. In many cases, however, DFTV and museum partners went through several rounds to identify an appropriate museum focus for a DFTV investigation. Finding a museum experience that would fit with the DFTV format involved airing the different ways in which museum staff thought about inquiry in relation to their exhibits, and in understanding the range of experiences museums offered.

DFTV’s original emphasis on finding an appropriate exhibit reflected its optimistic expectations about where educational opportunities existed in museum contexts. DFTV staff found that many exhibits were either too static or too difficult to connect to the real-world activities required by the DFTV format. Ultimately they found that some education department staff members were more involved in developing inquiry-based experiences than exhibit developers were. At times, they found they had to work closely with museum staff to create an experience that would meet the needs of the show’s format, while still showing kids interacting with museum resources. In reflecting on the entire season, a DFTV producer said, “The lesson out of Season 5 is that science museum exhibits are not developed as inquiry experiences for the museum-goers...now in Season 6 we explore ‘experiences’ that a visitor to the museum might have, and develop our story around that.”

Television thrives on having access to diverse experiences, but capturing these sometimes meant confronting and accommodating museum rules and regulations.

For the production crew, access to exhibits—including the ability to manipulate the museum space—was essential. In some cases, the production crew wanted to be able to turn off noisy exhibits that would conflict with the audio in their performance, light spaces, or have access to areas that was usually out of bounds to the public. This required an available museum staff person with the knowledge and authority to alter the museum space during the shoots. As one museum contact explained, “You had really better know everything about the museum, like where’s the power for the lights, how do you turn off an exhibit? Someone has to be there who knows the operation of the entire museum and be there the entire day while the shooting is happening.”

Museum rules and regulations sometimes required negotiations between DFTV and museum staff about what could be filmed. DFTV staff had to learn about museum limitations and rules, from the feasibility of shutting down floors or exhibits during museum hours, to handling animals. A museum educator explained, “We have very strict regulations on how we handle live animals...that was difficult for the television crew to understand. They were asking us to do things that we could not comfortably do. In the end, they were respectful of our restrictions and we worked it out.” In other cases, although museum staff insisted that exhibits could not be shut down, and that filming could not occur while visitors were at the museum, they arranged to give the crew access to exhibits when there would be no visitors around.³

³ In a survey of children watching these episodes of DragonflyTV, several viewers were puzzled that the museums seemed so empty.

DFTV staff’s professionalism and patience were noted again and again as instrumental in making for a smooth experience.

Despite the logistical and other challenges, museum staff described the experience positively. Many museum staff members praised the DFTV production staff, noting their professionalism and patience, as well as the science knowledge of those who dealt with content. Museum partners said, “It was a thoroughly professional, smooth process...Everybody respected everybody’s time, and responded in a timely manner,” “They were great to work with. I would encourage someone to do it,” and that they were “easy to work with, well-organized, and know what they were doing, and they were appreciative of what we did.”

In some cases, museum staff explicitly compared their DFTV experience with that of other television crews with whom they had worked, and described it as positive. “It was a good experience for everyone here. We deal with local television when they do a new exhibit. It’s chaos. With [DFTV,] they were here in two days, didn’t get in the way, and it was smooth.” Museum staff also praised the science knowledge of the DFTV staff who worked with them on story development: “I was very impressed with [the producer’s] knowledge of science. I thought it was very good to have a producer that had a good science background, because I work with TV folks that had no knowledge and it took a lot more effort and communication back and forth tweaking of scripts. With others, you had to carry them along to keep science on track. And respecting their knowledge of their craft, but being unyielding about the science, and that wasn’t a problem at all with this group,” and “They paid real attention to scientific accuracy and that was real important to me.”

Communication Strategies

Face to face meetings or conference calls between DFTV and museum partners were critically important to building understanding of the DFTV concept and story needs.

To allay some anxiety and misunderstandings, particularly at the beginning of the relationship, museum educators noted time and again the importance of meetings—whether conference calls or partner meetings—in communicating important information about the collaboration. As museum educator put it, “Something very positive which helped clear up communication was a sit down meeting between DFTV and [the museum education and public relations contacts]. I understood what they chose to do and why.” Several mentioned the value of the partners’ meeting in St. Paul, saying, “It doesn’t answer all your questions, but it makes you feel a little more confident going into it” and “I felt pretty in control and knowledgeable about what was going on once the partner meeting in Minnesota happened.”

DFTV staff learned what kinds of information the museums needed and how to be more clear about their own needs.

The DFTV producers gained experience throughout the process in understanding and communicating in ways that satisfied both partners. A producer explained, “People used to call us three months in advance, and they’d want a schedule [for the shoot] months in advance.” She learned that it was important to provide museums with a rough outline of

the schedule, cautioning that it might still change. Ultimately she realized that “they just wanted some general information.” The tension arose from different definitions of schedule: “They didn’t need to know what they were going to be shooting every five minutes at that point.”

Production staff learned that they also needed to communicate things like the exact size of a crew, whether they would be using generators, whether they would be setting up lights. The length of filming time was not always immediately clear to museum staff and production staff stumbled in communicating this effectively, noting some reticence to tell people how long a shoot might actually last. Reflecting on her own learning about the importance of communicating about production details, one DFTV producer explained, “In production, sometimes you worry about scaring the person on the other side of the phone by being too honest, but you need to be honest. You need to tell them you may need to do fourteen-hour days.”

When production staff realized that museum partners often had misconceptions about the shooting experience, either blowing “it out of proportion that we would be taking over their site” or imagining a much smaller impact than it actually was, they realized they had to be as specific as possible about what the shoot would entail. “We told people how many people were going to be there—that we never had more than ten people and generally only had four people in the crew—that we don’t set up lights, and it’s not like how movies are made.” They realized it was often necessary to repeat this information: “We had to continue to make it clear that we are not bringing a truck or generator; that the amount of equipment is smaller than they think.”

The most common suggestion from museum staff for future collaboration was to give partners a clear outline of the roles, responsibilities, and needs of the production.

In several cases, museum contacts said they would have liked a “road map” to get oriented to the project: “It would be nice to get an overall comprehensive guide—this is what kinds of resources within the facility are going to be used, what staff, departments, etc. A little road map of what things might look like over the next year, such as when they’ll be here for filming.”

Outcomes

Segment Satisfaction: Representing Museum Experiences

Museums were unanimously enthusiastic about the final products, though in some cases desire for publicity was a factor in their assessment of the overall product.

In baseline interviews, museum staff were concerned that the museum be represented as “engaging and where learning takes place,” “as fun, non-nerdy, accessible, and if they could show some of the diversity of kids and staff—that it is a comfortable accessible place,” and “a resource for information, and a place where they can try things out.”

Museum personnel were extremely satisfied with the representations of the science and of their institutions in the finished segments, saying, “We were really pleased with the way the piece turned out. We really felt like the producers were very accommodating to our corrections and suggestions. We wanted to be sure the museum was represented as it

should be,” and “This is a good representation of the kinds of things children might do in an after-school program at the [museum].” Several others commented specifically on how the museums were represented as places where children could have fun doing science, for instance, “It made it [visiting a science center] seem like it was a cool thing.”

Some highlighted their satisfaction with the depiction of science, for instance, “They did a good job showing what [science] they could show. They picked the right thing—appropriate for teaching that age range,” and another said, “I was extremely pleased. The science and the museum were well-represented: collecting data, bulk sampling for microfossils, recognizing patterns, sorting things out, representing results graphically. I thought it was just very solid and not overly complex. The girls were not asked to do things that were not covered by their knowledge at the time.”

Some enjoyed the inclusion of additional museum experiences in the segment. For instance, one noted that the segment included footage of a middle school art and technology exhibit, which resulted in a story that “showed the range of what we do.” Other specific concerns were that the name of the institution was mentioned, or that it was clear that not all the activities which the children conducted were available to the general public.

DFTV staff demonstrated a growing understanding of museum desires for establishing the uniqueness of their institutions as well as covering specific exhibits or features of their institutions.

Most museum staff wanted their institution to be clearly identifiable, that the segment include other signature exhibits, programs or architecture, and/or capture what is unique about the museum. The television staff did not at first realize how important it was to museums to have their institutions identifiable, and when possible to show other features of the site beyond what was in the story. Some of the first partners were disappointed in this regard. “There was nothing wrong with the way it showed the museum, but it wasn’t clear that it was [our museum].” But, as had been explained to this museum contact, “we were the first place they shot and they adjusted that”.

Interviews indicate that in subsequent segments, television staff better understood what was important to museums in this regard. Not only did the production staff recognize the need to include establishing shots of the institution itself, they better captured the uniqueness of the different exhibits and institutions. Museum staff described the segment as a “very nice representation of the exhibit and how the kids went through it— [you] got a sense of how special the exhibit is.” Another said “They did a wonderful plug at the beginning of the segment to highlight the museum itself. They hit one or two core themes. They picked up on how we market ourselves, our niche—inside the museum, and the exhibit halls. They did a good job of b-roll, kids running through exhibit halls, hair standing on end, going outside, and how much there is to see.” Another satisfied museum partner explained that DFTV “depicted the museum very well. They included a view from outside, running up the stairs—our trademark architectural feature, and a view from the park, backdropped by the Texas Star Ferris wheel which gave it a very local touch. They made our exhibit look like it worked better than it did, though they didn’t fudge the results.... Inside the museum, they showed kids playing with exhibits and they focused on

the ones we are proud of, ones that have been mainstays in our galleries, and that people always want to come back to.”

Two of the fifteen museums wrestled with the decision that was made to highlight a temporary or traveling exhibit in lieu of a permanent exhibit. One administrator commented, “We were very satisfied with the collaboration. The only thing we tried to influence in the beginning was to have something focus on our permanent exhibit...[but] we understand why they wanted to do [the focus they did],” “Another disappointment was that I wanted the bulk of the activity to be about the permanent component on our exhibit floor, so that there would be compelling reason to visit the [science center],” and “They did a nice job of highlighting exhibit animals, but didn’t reflect the scope of our educational activities.” The latter respondent—a museum educator—felt he would only be interested in doing another segment at his institution if it would better meet their promotional goals: “There would have to be more of a showcase of what we do here in our programs.”

DFTV staff affirmed that over the course of the season they learned the importance of depicting the museum front and including showpiece elements. However, in some cases, they felt that their ability to showcase the institutions as desired had in fact been hindered by the limited access which the museum staff had provided. One staff member explained that the “segments that are the strongest in terms of showcasing the learning center were the partners who were the most helpful. Those were the ones who didn’t kick us out after eight hours.” So in some cases, the ability to represent the museum offerings optimally had been limited by the restrictions of the museums themselves.

Partners offered varying perspectives on the uniqueness of the segments the collaboration produced. While DFTV staff generally noted the broadening of story ideas due to the input from the science centers, and the new travel format partners spoke more generally about the strength of collaborations.

Museum and television personnel were asked whether they felt the collaboration had resulted in a distinctly different series as a result of the collaboration. The most common responses from DFTV production staff were that the collaborations expanded the shows’ content and introduced a travel element which was not present in earlier seasons.⁴ For instance, “It’s certainly not easy, but the end result is one of the strongest seasons, if not the strongest season. Particularly because working with the science centers gave us more ideas—helped us break out of the box.” A producer noted that this season is different because of the travel and the “diversity in the types of areas in the country.”

Others noted first the season’s challenges, for instance, “The science segments sometimes seemed more forced together. We had to be more creative about how to make the museum exhibit relate to real world.” And one producer was unwilling to accept that the collaboration had an impact on the final product “because I want to believe that the producers were still in charge.”

For the most part, museum partners were not sufficiently knowledgeable about television formats to articulate ways in which the collaboration had an impact on the segments

⁴ The *GPS* museum-based series was DragonflyTV’s fifth season. The previous four seasons had included institutional partners from time to time, but not as a consistent feature of every episode.

produced. Rather, they saw the link between the collaboration and the resulting segment from their own institutional vantage point. For instance, they noted that collaboration “is a great way for television and media to make sure they have the most accurate and up to date and relevant information,” and that “collaboration is a terrific thing to do. The pooling of resources is important. There’s strength in numbers.”

Potential Use of the Segments

Museum staff were looking forward to using their segments for both educational and marketing ends

Museum partners noted a number of potential uses for the completed segments, such as showing segments during brown bag lunches for staff and volunteers, including the segment as part of an exhibit, and adding it to a video loop currently shown in the museum. In most cases, museum educator comments touched on many of these within one response. A selection of their responses follows:

Some museum educators said they “will add it to the loop of features we play in our viewspace and use it as an introduction about science in sports,” “I could show it each year to my new crew of docents to give them some info about saguaro,” “We have floor staff members and volunteer staff who work with that exhibit. It might be nice to have the segment in the exhibit in a loop, or demo with one of our volunteers,” and they “will show it in the webcast theater on the floor of museum with programs we’ve done, and this will be first non-local segment produced. So it would be part of the program in an hour-long loop.”

A number emphasized the potential value for education programs, such as using the segment in summer camps or with middle school teachers: “We might use it in teacher professional development to let them see how kids can do the activity. We might show it to different community youth programs before they go out and use the activity,” and “as an introduction to any playground program we might do—on simple machines or science investigation. It’s a nice learning point. The museum part is especially good.”

In one case, the segment highlighted an exhibit that had not yet opened, and the museum contact was particularly excited about how the segment could be used promotionally, noting “That will help us with funding, getting people in the door. We might have the segment shown as part of the opening event for the new exhibit on the electricity of life.”

In a few cases, museum educators felt the segment was of limited use because it highlights an exhibit which is no longer at the museum. For instance, “it’s tough because the exhibit is gone. Unfortunately we don’t have the research or the collection. We might use it with a summer camp and the bog might be something we talk about.” However, at least one museum has added the entire DFTV series to their video collection and hopes to make the segments available for a range of educational programs.

Another was particularly interested in the educator’s guide: “I am excited about the educator’s guide. That’s a resource that hopefully would be used. Not just giving ideas on activities, but highlighting other institutions—and I could see that as blossoming into collaborations or even sharing information.”

Museums were particularly happy with the segment’s value in giving them national publicity and recognition. They saw potential marketing value, but they varied in their success leveraging the segment for local publicity at the series’ premiere.

Educators and public relations partners felt that the collaboration succeeded in achieving the national publicity for which they hoped—“the episode is terrific on all counts. The museum got wonderful publicity out of it”—as this and earlier comments attest. Museum also recognized a number of uses of the segment for publicity beyond the national broadcast. Some saw it as “a promotional tool for marketing, for new staff and volunteers. ... We don’t have the ability to get this quality video on site, so we can use it as part of grant applications, and for marketing.”

In a few cities, museum staff successfully staged publicity events around the time of local broadcasts of the segments. One public relations professional thought the segment made the museum “look great” and gave it national exposure and that they “had accomplished what they set out to accomplish and wouldn’t do anything differently.” She continued, explaining that the “benefit to our museum was showing our museum on national television programming. We can use the DVD with our fundraisers and other publicity activities.” And speaking about the events they staged, said it was “nice to strengthen our relationship with the local PBS station, and to jointly host a premiere of the segment... our new superintendent of the school district and county commissioners came...that was a tangible good thing.”

DFTV staff related that whether museum events took place in the partner cities depended largely on whether a) the PBS station had scheduled DFTV, and b) if there was a pre-existing relationship between the museum and the PBS station. From the perspective of one museum staff, they were not able to stage an event “because we didn’t have the time, energy and money to make it happen.” Another related that the timing of the broadcast conflicted with other events that had already been scheduled at the museum.

Cross-Industry Learning

The collaboration created an opportunity for cross-industry learning between the television and museum professionals.

The museum professionals entered into the collaboration with a varying degree of experiences with and knowledge of television and media production. For some, learning about television production was an important benefit of the collaboration. In baseline interviews, many mentioned that this knowledge would be useful for future such collaborations or for better accommodating TV production on their grounds in the future. In only one case was the knowledge of production mentioned as something that would be valuable for production work on site, specifically the production of webcasts.

Those who had been interested in learning more about television production were very satisfied with the experience, observing that, “The filming was a lot of fun. It was a long day, but interesting to see behind the scenes how it worked and to see how much work went into the finished project. It left me with sort of a higher level of respect for all the people who do all of that work,” “I didn’t think we could get everything done in two days, but we did...It was very interesting for us to see a production put together,” “I had never seen anything like this before. How do you make it look like this?—having to film

the same thing over and over again, and how to set up lighting—that was very interesting. I learned more than expected,” and “It’s been interesting to see the process. You get to have a little more understanding when you watch TV, and you get more critical.” Some also noted the value of learning about the organizational structure of production, “I did learn a little bit about the roles of different people who work at a place like DFTV.”

A few others report a lot of previous experience with television production. “It was as crazy and hectic as I thought. But I’ve dealt with TV on and off, so it is demystified.”

Television staff also had varied responses to what they had learned about the other medium, in part based on their prior knowledge. They realized how varied museum were, and often noted surprise at the breadth of educational programming. For instance, a producer noted, “I was surprised by the depth of the education programs we kept finding at the science centers and how much outreach they were doing,” and another saw it as re-affirming an understanding that “The education staff does a lot with a little.” In one case, a producer explained that the collaboration “has certainly made me more aware of the variety of expression as what counts as informal science education, particularly in the museum context.” And some were impressed by the kinds of exhibits now available in museums, noting that they are “so much more fun” than when they were children.

Most museum educators felt that the experience only confirmed their understanding of inquiry science; however, a few did reflect on new ways of extending inquiry in the experiences they provide.

Asked directly whether their understanding of inquiry learning had changed as a result of the collaboration, most museum educators either felt the process had no impact on their understanding of inquiry or that it reinforced ideas they already had. For instance, one explained it was “more of a reinforcement. Nothing beats a really good hands-on experience, and not being lectured to, but working through it. So you can construct your own understanding of a concept. That’s why this project was so smooth and easy to do because it was so aligned with our understanding.”

Others, however, found that the experience prompted them to think in new ways about the work they do, such as creating “exhibits that are more interactive – something students can experiment with,” and extending inquiry into the training of junior docents, “When we train them, we don’t use the scientific method, we are more about experiencing things and relating those feelings and experiences to the visitors. So I’ve been inspired to at least think about using a scientific approach in our training with the kids.”

The experience stretched museum staff members’ thinking about the educational programs that they provide in other ways as well. In one case an educator saw how a particular exhibit could be used with children older than those with whom it had been used in the past. In another, the museum contact said she would “think more about how a family could have an experience with an exhibit, and experience and reflect on it at home,” thinking that informed the design of new parent guides. Another said the experience “has also helped to push the envelope for the zoo because it has helped us think in ways that encourage more direct contact with kids and the animals when possible... [and I wonder whether we] could design an exhibit where you have manipulatives around... We are more about animals, and conservation and empathy.”

DFTV thinking about inquiry in the museums evolved considerably, particularly in terms of understanding the range of museum experiences offered. This was discussed earlier in the section on story development and inquiry-based learning.

DFTV’s inclusion of inquiry both in the museum and outside the museum walls inspired several of the partners. Many museum educators were particularly enthusiastic about using DFTV as a model and inspiration for linking their institutions to real-world questions and investigations.

DFTV staff recognized that this series was unique in linking science centers and real world investigation. From the production perspective, including science centers was important in grounding where kids can get answers, instead of saying “I went and looked it up on the Internet,” which producers described as the default line they had used previously for attributing the sources of information.

Many museum staff members felt this was the series’ most groundbreaking aspect, “because it takes something we’ve rarely done—connect the museum to the real world.” He continued that the museum had “done precious little of that,” but was exploring ways of doing so on their website, noting, “We’re starting to realize there are so many ways to approach this.” Another educator said it “has confirmed what we do. Exhibits are important, [but the challenge is] trying to connect science education programs with the exhibits, and including a real world component.”

In some cases, this model occasioned serious reflection on how museums can continue to foster the continuities between visits to their institutions and outside activities. “I am more excited about science education in the museum because it has shown me that there is more possible than I thought. Having a segment on TV and having that as a jumping off point for kids, I have begun to think about any one of our exhibits [in terms of whether] this would make kids want to go home and do something at home, and try it on their own.” Another, however, wondered whether kids will actually do the follow-through: “We talked a lot about what kids can do with their dogs and cats. But will a kid do that? Will they get on the website? I don’t know.”

Discussions with the museum educators in particular illuminated some points of overlap in what television and museum education can achieve, and opportunities for complementing each other.

Discussions with museum educators suggest that the collaboration succeeded in opening reflection on the distinct characteristics and strengths of different kinds of informal science education experiences and articulating new ways professionals in these fields can support one another.

Participants often noted the continuities in the work of educational television and museums. In addition to the shared goals of science education discussed above, other continuities included the strength of both media in motivating children to engage in more extended science activities, though the “techniques are different.” Several emphasized a long-standing awareness that the two were “mutually beneficial,” and noted for instance how frequently children share information they’ve learned on television with museum staff. Another educator wondered how “we could be using more [TV], and how can we collaborate to get them off the couch and do a follow-up activity?”

Others described how their appreciation of television had grown; for instance, “What we learned is TV can be a vehicle to move kids to do those hands-on things; to motivate and think about doing science, and then do it. That’s an appreciation for the medium that we didn’t have.”

Television can provide non-local experiences, present in a few minutes processes that occur over long periods, and reach large audiences.

The most commonly mentioned strengths of televised science education were the opportunities for reaching wide audiences and the ability to seek out interesting stories and experts. Specific techniques such as collapsing time with time-lapse and other means, showing the end results of investigations and highlights, and motivating children about making investigations were among the strengths of television. “Well-done TV is a way to make people aware and get them excited.”

Museums are more adept at providing opportunities for longer term learning and showing the messiness of actual investigations.

In some cases, the museum educators saw museums as able to provide more in-depth and long-term opportunities for investigation, whereas television is “really under time constraints.” Informal science learning takes time and the television audience does not “have a chance to think about it and do it on their own, though it might inspire them to go and do it on their own.” One museum educator said that television offered an opportunity to increase “awareness about conservation and science,” but their own education department “takes people from awareness to action.”

In a few cases, the collaboration inspired reflection on media use within museums.

In a museum with an extensive webcasting program, the collaboration was a valuable tool for reflecting on internal practices, particularly the differences among media formats. An educator described sharing the segment with the webcasting staff and found that it “served to highlight the differences between what a highly produced TV show can do and what Web production can do.”

Others reflected on the value of media in their institutions. For instance, one thought “It would be so great to be able to video people interacting with exhibits and use that as a tool for seeing how people interact.... [And] with a video camera, you can talk about something you’ve learned; great way for them [kids] to express themselves and articulate what they’ve learned.”

Several science center educators said that if they participated in another collaboration they would incorporate the science of television production into programming at the science center. For instance, one explained “If I could do it all over again, I would involve more people in the learning process [about television production] to excite visitors... Maybe I would try to hold a workshop the day of filming and let them watch the filming, or have production staff spend 20 minutes talking to students.”

Summary of Findings

What Makes for a Successful Collaboration?

Recognizing a shared mission

- Recognizing that the two sets of partners shared a common mission was crucial in building trust and understanding, and in allowing these quickly-established and intense partnerships to move ahead.
- Museums recognized a number of other potential benefits for their institutions, including driving audiences to their doors through local and national publicity, and in some cases, boosting their reputations.
- In some instances, it was not clear how participating in a DragonflyTV segment would meet a museum's public relations goals, and this question created tensions between the museum's public relations staff and DFTV staff and between the public relations staff and education staff in the museum.
- Museum partners recognized the value of the collaboration in contributing to the field of informal science education through sharing materials and building networks.

Establishing clear roles and responsibilities

- Much of the tension, particularly before shooting occurred, arose from a lack of clarity about each partners' roles and expectations.
- In the end, the level of museum participation—in both story development and on-site support during the shoot—varied with each relationship.
- By the end of the season, DFTV staff reached a clearer sense of how they saw the role of museum partners, primarily as science content and facility experts. Museum partners were largely comfortable with their role as content and location advisors and felt their opinions were respected.
- On other media projects, museum staff had typically not been asked to review rough cuts. This stood out as an indicator of how engaged they became in the collaboration.
- Sorting out the responsibilities for casting was an early stumbling block for some partnerships.
- Museum and DFTV staff agreed that flexibility on the part of the museums made for a smoother experience for all.
- Each museum received a fee of approximately \$8,000 to cover staff costs; although it did not in most cases cover the actual expenses of the museums, this fee was seen as an important gesture on the part of DFTV, particularly when coupled with other benefits.

Aligning Work Cultures and Expectations

- The very different timelines along which museums and television produce their products was a source of tension between partners.

- Partners on both sides of the collaboration often began with little understanding of the other institution’s organizational structure or the roles and relationships of different positions within the organizations.

Production Challenges

- The very different uses of the term “interactivity” in the television and museum worlds initially impeded effective communication.
- Identifying a museum experience that could form the basis of a DFTV inquiry was a particular challenge, revealing how variously inquiry is defined in the television and museum contexts.
- Originally, DFTV staff approached science centers looking to identify a specific exhibit which they could showcase and use as a site at which to begin a science inquiry. In a number of instances, an appropriate exhibit was not readily available, so the producers and the museum staff created an exhibit-like experience in the museum for the children to investigate.
- Television thrives on having access to diverse experiences, but capturing these sometimes meant confronting and accommodating museum rules and regulations.
- The professionalism and patience of DFTV staff were noted again and again as instrumental in making for a smooth experience.

Communication Strategies

- Face to face meetings or conference calls including DFTV and museum partners were critically important to building understanding of the DFTV concept and story needs.
- Over time, DFTV staff learned what kinds of information the museums needed and how to be more clear about their own needs.
- The most common suggestion from museum staff for future collaboration was to give partners a clear outline the roles, responsibilities, and needs of the production.

Outcomes

Segment Satisfaction: Representing Museum Experiences

- Museums were unanimously enthusiastic about the final products, although in some cases publicity value was a factor in their assessment of the overall product.
- DFTV staff demonstrated a growing understanding of museum staff desires for establishing the uniqueness of their institutions and covering specific exhibits or features of their institutions.
- Partners offered varying perspectives on the uniqueness of the segments the collaboration produced. While DFTV staff generally noted the broadening of story ideas due to the input from the science centers, and the new travel format partners spoke more generally about the strength of collaborations.

Potential Use of the Segments

- Museum staff looked forward to using their segments for both educational and marketing ends.
- Museums were particularly happy with the segment's value in giving them national publicity and recognition. They saw potential marketing value, but they varied in their success leveraging the segment for local publicity at the series' premiere.

Cross-Industry Learning

- The collaboration provided an opportunity for cross-industry learning between the television and museum professionals.
- In most cases museum educators felt that the experience only confirmed their understanding of inquiry science; however a few did reflect on new ways of extending inquiry in the experiences they provide.
- DFTV's inclusion of inquiry both in the museum and outside the museum walls inspired several of the partners. Many of the museum educators were particularly enthusiastic about using DFTV as a model and inspiration for linking their institutions to real-world concerns and investigations.
- Discussions with the museum educators illuminated some points of overlap in what television and museum education can achieve, as well as opportunities for complementing each other.
- Television can provide non-local experiences, present in a few minutes processes that occur over long periods, and reach large audiences.
- Museums are more adept at providing opportunities for longer term learning and showing the messiness of actual investigations.
- In a few cases, the collaboration inspired reflection on media use within museums.

Discussion and Conclusion

The collaboration study examined fifteen different collaborations between DFTV's consistent and relatively small content and production staff and the staff at fifteen different informal learning institutions. The "one-to-many" structure of the project allowed DFTV staff members to use the experience gained in one collaboration to inform their work with the next, while each set of museum partners experienced the collaboration as a one-time event.

Individual participants from both sets of institutions entered the process with varying knowledge of informal science education and of work in one another's fields of education (television or museums). For instance, DFTV's content and senior staff had a good grasp of science education concepts, while production staff members were relative newcomers to the field. Museum educators also ranged in the depth of their experience in science education and inquiry-based learning, and represented institutions with different histories and emphases, such as research or hands-on experiential agendas, and different content areas. They also brought very different levels of experience with television production or with the media more generally to the partnerships.

While DFTV staff shared a fairly narrow view of science education, as shaped by the agenda for DFTV *GPS* segments, and more broadly through excluding consideration of other audio-visual formats, from radio to iPods to IMAX films, museum educators were often involved in a range of experiences, from exhibits to after-school programs. DFTV staff originally approached the museums intending to focus on a particular exhibit, assuming that this would be the logical fit for a DFTV inquiry segment, but over the course of the season realized the need to explore the range of museum experiences which might be applicable to a science investigation story.

Despite the very different starting points and the fact that DFTV was clearly the lead partner, the collaborations were overall judged a great success. Only one potential partner backed out after preliminary discussions, and DFTV successfully accommodated the needs of fifteen different institutions. The result was a set of highly individual science investigation segments that incorporated the science center as a source of content or starting point for a broader investigation. Museum partners were ultimately very pleased with their segments, including the representation of the institution and of the science. DFTV staff felt that working with these partners opened their eyes to new content that they would not otherwise have considered for the show. Creating a direct link to museum exhibits lead the producers to new types of investigations and storylines. The resulting investigations range from the design of a doghouse to the creation of an art installation, which expanded the format that had been applied to earlier seasons of the series. The segments portray museums as fun places for gaining knowledge in science, applicable to a range of interests and endeavors.

The collaboration also "pushed the envelope" on DFTV's earlier approach to inquiry. Although some of these segments were more challenging to produce from the DFTV perspective, they were also among the most innovative.

A significant lesson DFTV learned over the course of the season was an expanded range of strategies for partnering more effectively with museums and their various departments.

Collaboration participants had to meet a number of challenges, both those that are common to all collaborations, such as articulating shared goals and clarifying roles and responsibilities, and those that were unique to these partnerships, such as tensions between educational outcomes and publicity considerations (likely to arise any time the media are involved) and the unique uses of terms ranging from “casting call”, to “inquiry-based” and “interactivity”.

All participants gained exposure to and a new understanding of work conducted in another arena of informal science education. Museum staff learned that not all television productions are the same, and expanded their understanding of the kinds of science learning experiences which television can offer. The TV producers broadened their understanding of learning in museums, and expanded their sense of what “scientific inquiry” can mean. In many cases, the collaborations also occasioned reflection on practices within each profession. The DFTV were able to quickly integrate their experiences and reflection into the next round of stories and partnerships, while museum professionals will take the lessons they learned back to their institutions, a diffusion which will happen more gradually and will be harder to document decisively.

Each set of partners learned about the other—their work cultures, the media they work in, and their points of continuity as informal science educators. They also expanded their own visions of potential learning experiences, and developed a better understanding of how to work in media-museum collaborations in the future. But perhaps most important, the collaboration opens space for a new dialogue about strengths, limitations and potential for informal science education in different settings.

Appendices

Appendix A

Interview Protocols

- Baseline Interview Questions (all participants)
- Final Interview Questions (museum educators)
- Final Interview Questions (public relations personnel)
- Final Interview Questions (DFTV)

DragonflyTV Science Center Showcase Interview

(Baseline)

Interviewer's name:

Interview date:

We are conducting this interview with the participants in DragonflyTV Science Center Showcase series, including museum and television personnel. The purpose of the interview is to capture a sense of the participants' expectations, hopes, assumptions, and concerns about the nature of the collaboration and its possible outcomes (particularly in terms of professional development and the quality of the completed TV segments). At each museum we will be interviewing the individual in the education and PR departments most involved with the project, as well as other individuals as appropriate to each site. We will be contacting you again, following completion of production (2 weeks following rough cut for education/curatorial staff; and 2 weeks following broadcast for PR staff).

Interviewee's name

Institution

Title/position

Number of years you have worked in this field

Briefly describe your role:

A: In your institution

B. In the DragonflyTV project

(Education/curatorial etc staff only): Will you be participating in the development of web and print materials? What will your role be?

- How did you become involved in the DFTV project? (Who in your institution was initially contacted by DFTV and how did you become involved? If the interviewee says they are the coordinator, or were one of the first people contacted, at what point did they realize they needed to involve others within the museum? And was that clear from the start?)

[Museum Education Staff only]: Who in your institution was responsible for approving this project/collaboration? Could you provide me with their contact information?

About previous creative/collaborative experiences

1. Tell me about a successful past creative/development project you were part of in your field (e.g., creation of a museum exhibit, or production of a television segment). What made it successful for you? What were the important/critical considerations/steps/phases/etc. in the development of the project that most contributed to its success?
2. Describe a successful past creative/development project that involved **collaboration**, either with others in your field, or people from another discipline or medium. Why was it successful? What qualities of collaboration do you value? In general, what qualities of collaboration contribute to the most successful end product?

3. Have you had any unsatisfying previous collaborative experiences, especially with people from other fields? If so, why was it unsatisfying? What do you think went wrong? How could the experience have been made more successful?
4. In the past, how have you managed differences of opinion, miscommunication, or other problems in collaborative relationships?

About definitions of “inquiry” and “interactive” (SKIP THIS SECTION FOR PR/Marketing Interviewees)

For these questions, please think about a successful inquiry-based science project or initiative in which you've been involved.

Briefly describe the project: what it was about, how it was inquiry-based, and why you thought it was successful:

General follow-up questions:

1. How do you define “**inquiry-based**” activities or experiences, in general?
2. How do you define inquiry-based specifically in the work you do? (Museum or television.)
3. What have you learned about the characteristics of effective inquiry-based informal education experiences in the medium you work in? What works best to make something truly inquiry-based in your field?
4. Do you think the other medium you're working with (television for museum educators, museum educators for television personnel) defines inquiry-based the way you do? How do you think the definitions differ? Do you think effective inquiry based experiences are different in the other medium? If so, how? Do you think the other medium has strengths/weaknesses in terms of being successfully inquiry based?

For these questions, please think about a successful interactive science project or initiative in which you've been involved. (It might be the same one you just discussed.)

Briefly describe the project: what it was about, how it was interactive, and why you thought it was successful.

5. How do you define “**interactive**” informal science, in general?
6. How do you define interactive specifically in the work you do?
7. What have you learned about the specific characteristics of effective interactive informal education experiences in the medium you work in? What works best to make something truly inquiry based in your field?

8. Do you think the other medium you're working with (television for museum educators, museum educators for television personnel) defines interactive the way you do? How do you think the definitions differ? Do you think effective interactive experiences are different in the other medium? If so, how? Do you think the other medium has strengths/weaknesses in terms of being successfully interactive?

Your hopes for the project (collaboration related)

1. Please list some outcomes you hope might occur as a result of this collaboration in the following three categories. (For each outcome you mention, rate whether you think the outcome you hope for is not very likely, reasonably likely, or very likely):

Institutional outcomes (how might your organization benefit?)

Personal outcomes (how might you/your office benefit?)

Outcomes for the broader field (how might informal educators benefit?)

2. What do you hope to:

Learn from this experience?

Teach in this experience?

Your hopes for the project (product related)

1. In terms of the final product (the television segments), please list some outcomes you hope might occur. Do you think the segments will break new ground as a result of the innovative effort to blend the television and museum resources? Specifically, how do you envision those segments working/looking/sounding? (*When you think about other science television, how might this differ?*)
2. When the segments are finished, how will you personally measure their success? What segment characteristics or qualities will tell you that the goal of blending the two media has been achieved? (*What will happen that will make you feel this was a success?*)
3. **[For museum personnel]** If you could describe a successful television representation of a museum experience, what would it be? What should the TV segment capture? What concerns do you have about how TV will represent a museum experience? (*When you see the segment, what is going to make you say, "they got it right", or what might they do that you would say, "ouch! They really didn't get it/didn't get who we are"*).

About the collaboration so far

For Twin Cities personnel:

1. What kinds/levels of contact have you had with museum personnel so far? [Note: this will vary, as TV staff are interacting with up to 12 different institutions. Probe for description of various kinds and levels of contact, including the positions of people with whom they've had contact.]
2. What are your observations so far about your communication with the museum personnel? Is it what you expected, so far? Have there been any surprises?
 - Did you find the partner meeting in St Paul valuable? In what way was it valuable? What if anything did you learn about the perspectives of your museum partners at this meeting?
3. Do you have any concerns about how things are going?

For museum personnel:

1. How much contact have you had with the DragonflyTV personnel to date? (*Who have you had contact with and could you describe that contact, e.g. frequency, satisfactory...*)
2. What are your observations so far about your communication with the TV staff? Is it what you expected, so far? Have there been any surprises? (*Have there been any miscommunications or problems?*)
 - Did you find the partner meeting in St Paul valuable? In what way was it valuable? What if anything did you learn about the collaboration and/or your DFTV partners?
3. Do you have any concerns at this point about how things are going?

Specific issues (for both)

The relationship between Twin Cities Public Television and museums has taken the form of minigrants.

1. Is the minigrant approach working so far?
2. Is the established \$7,500 minigrant to cover staff and related costs sufficient?
3. Twin Cities estimates it will take 80 hours of museum staff time to plan for and produce a local segment. Does this seem reasonable at this point?

Other questions or comments?

Please share any other thoughts or questions you have about the project so far.

**DragonflyTV Collaboration Study
Post-Production Museum Educator/Curator Interviews**

Interviewee:

Date:

Interviewer's Initials:

As we discussed in the fall, RMC is conducting two rounds of interviews with participants involved in the DFTV project. Now that production is completed on your segment and you've had a chance to view the rough cut, we'd like to learn about how the experience went. As in the past, your responses will remain confidential. Identifying information about you or your institution will be omitted from results published for readers beyond the DFTV staff.

PRELIMINARY

[Note to Interviewers: Review background information from pre-interview and complete information on how institute became involved with the collaboration.]

1. How did your **institution become involved**? (e.g. contacted by Executive Producer, saw RFP...)
2. **Access to resources** within the institution was an issue for some of the museum staff involved with the DFTV collaboration.
 - a. Was this an issue for you?
 - b. Could you describe the bureaucratic distance between your position and access to resources within your institution?
 - c. How large is the professional staff at the institution?
3. What is the usual relationship **between exhibits/curatorial staff and education staff** in the design of new exhibits/experiences at your institution?

THE PROCESS

1. [Interviewers: Use grid for recording these responses.]
 - a. Describe your **roles** in the DragonflyTV collaboration as relates to each of the following:
 - i. Initial contact
 - ii. Liaison between museum and DFTV
 - iii. Story development
 - iv. Casting
 - v. Production coordinator (for museum)
 - vi. Rough Cut Review
 - vii. Educational Materials development
 - viii. Other

b, We want to learn **what your experience was like** in each of these roles or phases. We will go through the phases one at a time, and I'd like you to select a symbol for each to describe how you felt during that phase and then tell me why you chose that symbol. What were the significant components of that role/phase for you, what worked or didn't.

- Select a symbol.
- During this particular phase/role, what occurred.... surprises, learning, community building, miscommunication, misunderstanding, shared goals and expectations, what you wished you could have done, what kind of influence you wished you had, and/or conflicting expectations

2. Overall, are you **satisfied with how the collaboration** went? Explain.

3. Did the collaboration meet your expectations in terms of **learning about television production**? Why or why not?

4. What was the **most challenging** aspect of working with DragonflyTV?

5. What **advice** would you give to museum staff persons going into such a collaboration?

THE PRODUCT

1. If you were involved in the development of the story, could you **describe the evolution of the story concept**? What were the original ideas you had? What were some of your assumptions about what kind of story would be appropriate, and how did those change (or not) in the process of story development?

2. Are you **satisfied with the segment produced** at your institution? Why or why not?

- Is it accurate, fair, representative; Does it reflect the best aspects of each of the above?

In terms of...

- a. Representation of the **museum** e.g. Does the segment do justice to your institution? What else might have been included?
- b. Representation of the **exhibit**?
- c. **Science story and content**?

3. What would you have **done differently** to better showcase your museum, exhibit, or the science content?

4a. Do you think differently about the **strength of DFTV** as a medium of science learning as a result of your collaboration?

4b. Do you think differently about the **strength of television** or video as a medium of science learning as a result of your collaboration?

5. How might you **use the segment** in your museum or educational programming?

SCIENCE EDUCATION

1a. Has this experience **changed how you think about science education** in the museum setting?

1b. How has your understanding of **inquiry-based learning** changed as a result of this experience?

1c. How has your understanding of **interactive learning** changed as a result of this experience?

2. Has this experience **changed how you think about curating or programming** experiences **in the museum**?

- Would you change the exhibit which was highlighted in the show based on what you have learned?
- Describe specific projects (existing or possible) and how your thinking about them has changed because of this experience.

CONCLUSION

1. What did you **learn about television professionals** as informal science educators?
 - Strengths? Weaknesses?
2. Has this experience **changed your expectations about such partnerships**?
3. **Would you do this again?** Why or why not? What would need to be different to engage in a collaboration again?
4. How would you **characterize this collaboration**? Equal partners or not?
 - a. Roles
 - b. Expertise

DragonflyTV Science Center Showcase Interview PR/Marketing Interviews (Following Broadcast)

Interviewee's name

Interview date:

Interviewer's initials:

As we discussed in the fall, RMC is conducting two rounds of interviews with participants involved in the DFTV project. Now that production is completed on your segment and you've had your premiere event, we'd like to learn about how the experience went. As in the past, your responses will remain confidential. Identifying information about you or your institution will be omitted from results published for readers beyond the DFTV staff.

BROADCAST PREMIERE EVENT

1. Briefly describe the event you held for the broadcast premiere of the series.
2. Are you satisfied with the event you staged? Why or why not? What might you do differently in the future?
3. Did you get the support you needed from DFTV for the production of the event? Explain.
4. Do you think broadcast of the segment in which your institution was featured has had or will have the marketing impact you had hoped for? Explain.

THE PRODUCT

1. Are you satisfied with the segment produced at your institution? Why or why not?
Is it accurate, fair, representative; Does it reflect the best aspects of each of the above? and in terms of...
 - a. Representation of the museum e.g. Does the segment do justice to your institution? What else might have been included?
 - b. Representation of the exhibit?
 - c. Science story and content?
2. What would you have done differently to better showcase your museum, exhibit, or the science content?
3. Have this collaboration and the product produced changed your understanding of the value and outcomes for your institution of working with television? If so, how?

THE PROCESS

1. How did you experience working with DFTV differ from other film or TV crews you have worked with? How would you explain the production process and experience of working with

DFTV to another science center that has just gotten involved in such a collaboration? How can DFTV best explain what they do to new museum partners?

2. Overall, are you satisfied with the collaboration? Explain.

Did the experience result in enhancing collaboration or communication WITHIN your organization?

3. Did the collaboration meet your expectations in terms of learning about television production? Why or why not? Were there specific terms or aspects of production that you learned about that would be helpful for others to know?

4. What was the most challenging aspect of working with DragonflyTV?

5. What advice would you give to museum staff persons going into such a collaboration?

CONCLUSION

1. Has this experience changed your expectations about such partnerships?

2. What did you learn about your own institution or your capacity for such projects?

3. Would you do this again? Why or why not? What would need to be different to engage in a collaboration again?

4. How would you characterize this collaboration? Equal partners or not?

- Roles

- Expertise

5. What do you think was the most important outcome of your involvement in this project?

6. Is there anything else you would like to share about this experience?

DragonflyTV Science Center Showcase Interview

Production Staff Interviews Following Completion of Series

Interviewee:

Interview date:

Interviewer's initials:

THE PROCESS

1. Describe what you saw as the greatest strengths and challenges in collaborating with science centers on the production of the DFTV segments?

- i. Initial contact
- ii. Ongoing communication
- iii. Exhibit selection/Story development
- iv. Casting
- v. On-site Production
- vi. Rough Cut Review
- vii. Educational Materials development
- viii. Other

What did you learn about the DFTV feel or content from the experience of producing these segments? And they experience of doing two shoots at the Exploratorium?

THE COLLABORATION

2. Overall, are you **satisfied with how the collaboration** went? Explain.

3. Did the collaboration meet your expectations in terms of what science centers could bring to the development of DFTV segments? Why or why not?

4. What was the **most challenging** aspect of working with science centers?

5. What **advice** would you give to television production persons going into such a collaboration?

THE PRODUCT

1. How do you think these segments differed qualitatively from those produced in prior seasons? (not involving the collaboration of science centers)

2. What impact do you think the involvement of science centers had on the final product?

What elements and/or characteristics of the segment themselves most contribute to achieving the goals of increasing interest and understanding of inquiry-based learning, and encouraging viewers to more frequently visit science museums/centers? (Alice...purpose here is to get them to “dissect” their segments and tell us what works and what doesn’t, and what’s missing when a segment doesn’t work. You might phrase the question differently, but that’s the intent. Might be as simple as “in your professional view, what makes a good [DFTV] segment?”)

SCIENCE EDUCATION

1. Has this experience changed how you think about **science education in the museum setting**? If so, how?
2. How has your understanding of **inquiry-based learning** changed as a result of this experience?
3. How has your understanding of **interactive learning** changed as a result of this experience?
4. How has your thinking about **television, and particularly DFTV as a medium of science learning** changed as a result of your collaboration?

CONCLUSION

1. What did you **learn about museum professionals** as informal science educators?
 - Strengths? Weaknesses?
2. Has this experience **changed your expectations about such partnerships**?
3. What could help to make **future collaborations** go more smoothly?
4. How would you **characterize this collaboration**? Equal partners or not?
 - a. Roles
 - b. Expertise
5. Do you think your work with science centers in these productions will result in any long-term relationships with either individuals or centers/museums?

Appendix B

Report on the Preliminary Findings (Baseline Interviews)
Presentation Slides, Association of Science and Technology Centers

DragonflyTV Collaboration Study Preliminary Findings from Baseline Interviews

Introduction

RMC Research is currently conducting baseline interviews for a study of the collaboration between science center and television personnel in the production of DragonflyTV (DFTV) GPS Edition. At the center of the inquiry is documenting the changing attitudes and knowledge of science education as it relates to the unique collaboration between two very different educational contexts – television and museums. These baseline interviews are designed to gather preliminary data on the understanding of science education concepts such as inquiry and interactivity, in and about the two media, as well as information on the dynamics of the collaboration. To date, RMC staff has interviewed a total of 21 individuals involved in the DFTV collaboration, including six DFTV production personnel, seven museum educators/curators, and eight museum staff in public relations or communications positions.

While the study is designed ultimately to measure change in attitudes and knowledge relating to science education in the two media, interview data at this point suggests in fact, the diversity of perspectives, knowledge, and backgrounds of individuals within each industry working on the collaboration, as well as the complexity of usage of terms such as inquiry-based and interactivity. These baseline interviews will provide a rich basis for developing a more nuanced tool for teasing out the concepts and practices surrounding science education in the two fields, and the ways in which the collaboration has stretched understandings of science education for the participants, all necessary for building a shared vocabulary and understanding of the work processes for future endeavors.

Preliminary findings, particularly those related to understandings of science education concepts are presented below, with a few notes about collaboration. Data has also been collected about other aspects of science education, the process of developing educational media, collaboration expectations, and about specific aspects of the DragonflyTV collaboration such as communication and the partnership fee (formerly mini-grant).

Science Education Concepts: Inquiry-Based, Interactivity, and Related Ideas

DFTV staff:

- DFTV staff has varying backgrounds and knowledge of science education; with senior staff and science staff having extensive backgrounds in informal science education, while production staff members are newcomers to the field.
- DFTV staff is united in their approach to science education, as shaped by the DFTV format and by television more generally. This includes a shared definition of inquiry and concerns for kid-friendly, action-oriented science investigation, such as sports-related investigations. Large-scale movement and visual interest are also important in selecting exhibits and developing stories.

- DFTV staff members hold varying meanings of interactivity, from applying it to children's use of web materials following seeing the show, to what the children are doing in front of the show. It was also used in the context of getting outside the museum walls.
- Several of the production staff noted that the term interactive is perhaps not the most appropriate word to describe what they are doing, and that terms such as "kid-friendly" and visual are better for describing the kind of engagement which they need to capture on camera to make a compelling story.
- DFTV staff members generally see science centers as focused on delivering science content, rather than providing inquiry-based experiences. DFTV producers have found that in some cases, education department staff members are more involved in developing inquiry-based experiences than are exhibit developers.

Museum Personnel

- Museum staff varied in their familiarity with and depth of understanding of the science education topics. Personnel in education had ready, if varied, answers. However, several of the public relations personnel had little involvement in science education topics and in those cases did not respond to the questions about definitions of inquiry-based and interactive learning. Two of the individuals responsible for the public relations aspect of the collaboration develop public programs for their institution and are closer to the science education topics. The term "museum educators" as used below refers to all of those who responded to these questions.
- Museum educators all embrace inquiry as a question driven process, but emphasized a variety of related ideas in their definition of the term, including "student-driven," "creating dialogue," "leaves the learner asking more," "the question is more important than the answer," and a multi-step process such as "engaged, explore, explain, elaborate." Several noted that the inquiry process starts and ends with questions. In a couple of cases, museum personnel noted the varied definitions of inquiry which are used even within a single institution.
- Several museum educators articulated different kinds or degrees of inquiry, and drew distinctions, for instance, between different levels of inquiry possible in museums such as highly structured exhibits, facilitated or guided activities, and open-ended activities which might produce results outside of the original objectives. One educator noted that the degree of inquiry in an exhibit depends on facilities and time available, while another approached this from the limitations of inquiry in the museum and the need to provide varying amounts of interpretation for an exhibit to be successful.
- Museum educators noted a range of definitions and criteria for interactive including "engaged by thinking, looking, doing," or emphasized one aspect of this, such as "hands-on," "whole body," "minds-on," "engaged by thinking," and "something that produces a response." Speaking about the zoo environment one educator described immersion as the goal rather than interactivity because of the limitations presented by the environment. One museum educator spoke of different

levels of interactive, and described a good exhibit as one that “engages the senses and requires you to ask questions.” Museum educators approached the notion of interactivity from the perspective of the visitor interacting either with an exhibit or with others in the museum environment.

- Inquiry-based and interactivity were seen as closely related by several respondents. For instance, one museum educator noted that, “Inquiry-based learning has a better chance if body and mind are engaged,” while others felt they were overlapping concepts.
- Many of the museum educators noted that television is not interactive, and some described it as “a one-way medium,” that it “can never create dialogue,” and that “you do it through someone else’s eyes.” Television was described as “telling a story about science inquiry,” in which the possibility for interactivity depends on reproducing the process at home, and may be supported by the web.
- Speaking of the limitations of inquiry on television, several museum educators noted that on television the viewer is not posing the question, though “hopefully the TV show will pose a question the viewer is interested in.” One museum educator described the DFTV idea of inquiry as “procedural,” while another noted that “inquiry is slow, methodical, very reflective. It doesn’t work on TV. You can never show thinking or show all the possibilities that were considered, or the time that it takes. You don’t get an appreciation of how science works, but you can show how gratifying it is at the end.”
- Additional assets of museum learning noted by museum educators included that museums offer opportunities for group learning, such as children and parents to engage in shared inquiry, and several noted the increasingly important role of exhibit facilitators in aiding the inquiry process.
- Several museum educators responded that both televisions and science museums focus on affective learning, and can have the greatest impact in motivating children to initiate inquiry.

Collaboration

- Generally agreement across fields about what is required for successful collaboration – shared goals, equal commitment, sufficient resources, and understanding of the working process of partners.
- A frustration expressed by DFTV staff is the need to communicate with multiple people in each science center, and sometimes there is little communication between departments such as education and public relations.
- Many of the museum staff expressed that learning TV production is one of the things they hope to get out of the experience. In several cases they mentioned that this knowledge would be useful for future such collaborations or better accommodating TV production on their grounds. In only one case was the knowledge of production mentioned as something that would be valuable for production work on site, specifically the production of webcasts.

- Museum and television staff noted some of the differences in work styles and challenges around logistics. For instance, DFTV staff were concerned about some museums reluctance to close off exhibit halls during shooting, and explained that television requires flexibility, e.g. if weather conditions prevent filming outdoor sequences as scheduled need to use that time to film indoor ones.



Going Places in Science

Summative Evaluation

Collaboration Study

Child Study



Collaboration Study Goals

- **To understand the effectiveness of the collaboration between DFTV producers and museum partners for:**
 - producing science television segments and
 - providing a professional development experience, expanding knowledge and use of different media and science education practices of professionals in both fields.

Goals

Collaboration Study Methodology

- **Two Rounds of Interviews:**
 - Baseline: before shooting
 - Final: after completion of production
- **Interviewees:**
 - DFTV Production Personnel
 - Museum Education/Curatorial Partners
 - Museum PR/Communications Partners

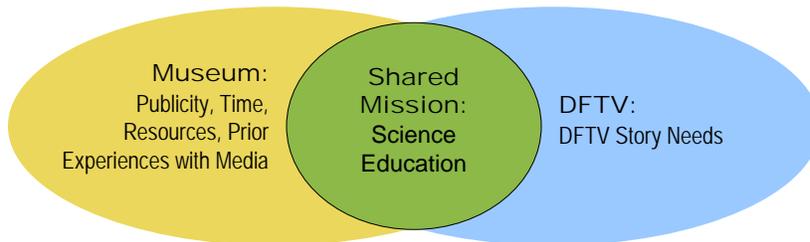
Methodology

What Makes a Successful Collaboration?



Building a Successful Collaboration

Shared Mission



"it's a teaching moment; it's about kids learning science"
– DFTV Staff

"I think the kind of work they do is the kind of work we do... We really do emphasize hands on experiential learning as much as we can."
– Museum Educator

"making science fun and relevant, and making connections in everyday life"
– Museum Educator

Building a Successful Collaboration

Work Cultures & Expectations

Television

- Quick turnaround time
- Small production staff
- Access is key
- Production specifics and terminology, e.g. size of crew, "casting call"

Museums

- Long-term planning
- Multi-department institutions
- Rules about uses of exhibit space, not interfering with visitors, etc.

"All we needed to do was come up with the content and review the draft, including editing scientific names. They do a lot more of the work than I initially thought I'd be doing."

– Museum Partner

Finding the Story

Inquiry on DragonflyTV

DFTV Episodes Portray:

- context in which the investigation takes place
- a clear statement of the research question
- a method for investigating
- an analysis of findings
- a statement of conclusion
- the next question of interest

Museums Offered Multiple Definitions and Criteria:

- Raising questions
- Inquiry cycle
- Degrees of inquiry
- Student-driven
- Creating dialogue
- Engage, explore, explain, elaborate
- Open-ended activities versus Facilitated activities

"The lesson out of Season 5 is that science museum exhibits are not developed as inquiry experiences for the museum-goers...now in Season 6 we explore 'experiences' that a visitor to the museum might have, and develop our story around that." – DFTV Staff

Creating Engaging Television

Defining "Interactivity"

Television

Kid-Friendly
Action-oriented
Visual

Museums

Hands-on
Minds-on
Whole Body
Engage by thinking
Something that produces a response

"We were trying to identify what was an attractive exhibit versus what makes engaging television. The keyword that was causing so much disconnect was interactivity."

– DFTV Staff

Enriching DFTV Stories

- Expanded pool of ideas
- Museum educators as content and location experts

*"Yes, we felt like equal partners.
We had a lot of say in the script
and were able to change things.
We felt very equal in that respect."*

– Museum partner

New Stories and Investigations

Light & Color: An Art Project Without Paint



*"The production
staff felt there was
no action in the
story...how do you
shoot a rainbow,
light and colors?"*

– DFTV Staff

Representing Museum Experiences



Museum Partners

Feedback on their Stories

- Museum partners were pleased with:
- Story
- Science
- Museum representation

*"Thought it came across really well – the experiment that they did, the way they collected data. The science center looked great. Made it look fun to do science."
– Science Center Educator*

Museum Partners

Using Media in the Museum

- **Possible Uses of DFTV Segments**
- Include as part of exhibit
- Use in education programs, e.g. camps
- Staff or volunteer training

Publicity

"There were two events held for different audiences. There was an invitational event for patrons of the museum and the public television station, as well as museum board members... The second event was held on a Saturday, billed as DragonflyTV Day. It was open to the public after extensive promotion of the day on the local PBS television station and radio... The benefit to our museum was showing our museum on national television programming. We can use the DVD with our fundraisers and other publicity activities."

– Museum partner

What did museum partners learn?



Museum Learning

Learning About TV Production

"The filming was a lot of fun. It was a long day, but interesting to see behind the scenes how it worked; and to see how much work went into the finished project. It left me with sort of a higher level of respect for all the people who do all of that work."

-Museum educator

"it just opens your eyes with what you can do with the materials and exhibits. We're now talking about doing virtual iPod tours."
- Museum Educator

Museum Learning

Reflecting on Inquiry in Science Center Programs

"Perhaps [one outcome was] a little bit of changed thinking about our junior docent program. When we train them, we don't use the scientific method, we are more about experiencing things and relating those feelings and experiences to the visitors. So I've been inspired to at least think about using a scientific approach in our training with the kids."

– Museum Educator

Linking science centers and the "real world"



"What we learned is that TV can be a vehicle to move kids to do those hands-on things; to motivate and think about doing science, and then do it. That's an appreciation for the medium that we didn't have."

– Museum Educator



Museum Learning

Inspiring Kids to Conduct Investigations at Home

"I am more excited about science education in the museum because it has shown me that there is more possible than I thought... I have begun to think about any one of our exhibits – would this make kids want to go home and do something at home, and try it on their own?"

- Museum Educator

Museum Community Responses

Review of Museum-based Segments of DragonflyTV: Going Places in Science, Multimedia Research, July 12, 2006

"The segments were excellent in showing how connections can be made beyond the museum walls. They showed ordinary kids using ordinary things to explain things of interest in their lives."

-Museum study participant

Museum Community Responses

Review of Museum-based Segments of DragonflyTV: Going Places in Science, Multimedia Research, July 12, 2006

“These segments portray the types of behaviors that informal learning centers hope to inspire in their visitors [They] explicitly demonstrate the utility of the museum as a laboratory and a resource for a depth of investigation that goes beyond the exhibit or program experience.”

-Museum study participant

Child Study

- Children said they would like to conduct investigations like those they had seen on DFTV.
- The most commonly mentioned barriers to doing so were:
 - parents
 - resources

“We talked a lot about what kids can do with their dogs and cats. But will a kid do that? Will they get on the web site? I don’t know.”
– Museum Educator



The Next Questions of Interest

- How can we support investigation beyond the museum visit?
- What are some productive directions for future collaborations between television and science centers?

Thank you.

