

[caise](#)

**center for advancement of  
informal science education**

Enter Search...

Search ▶



 [CAISE RSS](#)

- [Home](#)
- [News & Comments](#)
- [ISE Spotlights](#)
- [Resources](#)
- [CAISE Programs](#)
- [About CAISE](#)

Subscribe to the CAISE Newsletter

Email address

Submit

[Return](#) | [Print](#)

## **Border Crossings in Informal Science Education: DragonflyTV's Experiment in Museum-Media Collaboration**

**Alice Apley**

**The *DragonflyTV* Museum-Media Experiment**



A recent collaboration between the production staff of *DragonflyTV* and 29 institutions of informal science learning pushed beyond the traditional roles of museum-media partnerships by engaging museum professionals in the production of television content and featuring the partner institutions on the TV show. The 14 *DragonflyTV* episodes produced as part of these partnerships were subtitled *DragonflyTV GPS: Going Places in Science* and were

produced over two production seasons. The collaborations involved both large and small institutions, including hands-on science centers and natural history museums, as well as visitor centers in state and national parks. A study of the collaborations revealed some striking differences between the two arenas of informal science education. The process of collaborating created opportunities for the partners to think about informal science education in ways that extended beyond their familiar television or museum worlds and enriched both fields. *DragonflyTV* is a PBS children’s series, produced by Twin Cities Public Television in St. Paul, Minnesota, that showcases middle school children doing their own inquiry-based investigations. The series is currently producing its seventh season ([dragonflytv.org](http://dragonflytv.org)).

The key component of *DragonflyTV GPS* that represented a departure from previous collaborations was a series of short, but intense, partnerships, in which *DragonflyTV* engaged teams of museum professionals at the 29 institutions in the production of television content. Previously, educationally oriented museum-media collaborations had largely involved museum staff in the development of supplements to a broadcast production, such as exhibits and hands-on activity centers. For example, WGBH’s *Zoom* series created “ZOOMzones” in selected museums, and Scholastic’s *Magic Schoolbus* created a touring exhibition.

Within the constraints of the collaborations—*DragonflyTV* maintained editorial control—the museum educators were asked to think like television producers. They identified aspects of their institutions around which a *DragonflyTV* inquiry could be constructed. They provided content and location expertise throughout the production process. Museum educators also reviewed a rough cut of the video segment before it aired. For their part, the TV producers relinquished control over the science content of the episodes. They entrusted museum partners with identifying suitable museum exhibits and stories relevant to their institutions, testing experiments, and providing location scouting and support during shooting. The collaboration thus offered both museum and television professionals the opportunity to learn about each other’s approaches to informal science education.

In 2005, RMC Research Corporation, in Portsmouth, New Hampshire, began summative evaluation work on *DragonflyTV*, which would extend over the two *GPS* seasons. Through a series of interviews with museum staff and the staff of the TV show, we followed the collaborations closely. In addition to documenting partners’ expectations, challenges, and learning, the evaluation allowed us to view the work of both television and museum partners from the perspective of a broader landscape of informal education.

This article outlines some of the basic differences in perspectives on informal science education as manifested by the collaboration. It also highlights how partners on both the television and museum sides of the equation were able to see their own and one another’s work through this experience. We focused specifically on the concepts of “inquiry” and “interactivity,” as we asked all of the partners to define and discuss these concepts at the beginning and the conclusion of the collaborations. We found that the differing ways in which partners understood the terms were at the center of some of the greatest challenges in working together. These concepts also revealed much about how each viewed the opportunities and limitations of media and museums for providing informal science education experiences.

### **Imagining Inquiry-based Experiences on Television and in Museums**

We found that the definitions of inquiry varied between museums and media professionals. While museum educators offered a wide range of views about inquiry, almost all of their definitions embraced the importance of a question-driven process. Some emphasized the importance of starting and ending with questions. Others focused on the open-ended nature of the process—that it should “leave the

learner asking more.” Others focused on the learner’s context, describing the process as “student-driven,” or on the social character of inquiry, seeing it as “creating dialogue.” Yet others offered a view of inquiry as involving distinct steps, for instance, “engage, explore, explain, and elaborate.” In some cases, museum educators noted that different degrees of inquiry were possible. They contrasted, for instance, the kind of inquiry that could occur as part of a structured exhibit with that possible during a facilitated floor or open-ended activity.

We found that early in the first of the two *GPS* seasons, some museum educators—accustomed to working with visitors who explored their own questions in real time—were skeptical about the effectiveness of inquiry presented on television. In various ways, they pointed to the limitations of *DragonflyTV*’s model. Some described the model as “procedural.” Others noted that the viewer was not able to pose a question, though “hopefully the TV show will pose a question the viewer is interested in.” Further contrasting an ideal of inquiry with what was possible on television, one educator explained that “inquiry is slow, methodical, and very reflective.” The educator felt these aspects could not be adequately represented on television, though television could show the gratification of achieving results. These comments point to what many of the museum collaborators seek to achieve with visitors: the time and space for visitors to participate in an inquiry cycle of their own choosing. By doing so, museums hope to facilitate content learning as well as an appreciation of the process of inquiry.

In turn, *DragonflyTV* staff understood inquiry through a lens shaped by the medium of television as well as the very specific model of the *DragonflyTV* series. The show’s main educational goal is to model the process of science inquiry for viewers. It employs a notion of “full inquiry” drawn from the National Science Education Standards. Each investigation segment follows a similar structure, in which child investigators pose questions, design and conduct experiments, gather data, analyze that data, draw their own conclusions, and pose further questions. *DragonflyTV* production staff, who themselves had varied backgrounds and understandings of science education, were operating from a commitment to this single definition.

At first, the *DragonflyTV* staff imagined that all museum exhibits would lend themselves to adaptation into an inquiry-based television segment. They were then surprised to find that not all exhibits could be easily converted to the full-inquiry model employed on the show. Some museum educators pointed out that a good exhibit may simply raise new questions—the heart of inquiry—for many ages and types of audiences. As the season continued, *DragonflyTV* staff came to understand and appreciate the variety of educational experiences that museums had to offer. So, while sticking to their model of full inquiry, and also to featuring a museum exhibit in each investigation, *DragonflyTV* staff found different ways of using the exhibits in the stories. For example, museum exhibits were used to motivate investigations, provide science content, and shape inquiries or data collection. In addition, *DragonflyTV* episodes began to incorporate activities as well as formal exhibits into the series, taking the investigations to tabletops, to field sites, and into the community.

### **The Many Faces of “Interactivity”**

The multiple meanings of the term “interactivity” led to collaboration challenges, while revealing some of the fundamental differences in how the television and museums operate in conducting science education.

In their opening discussions about identifying suitable museum experiences to tape for television, the *DragonflyTV* producers described what they were looking for as “interactive.” To them, “interactive” meant high-energy, action-oriented, large-scale activities that would make for engaging and visually interesting television. In contrast, for the museum partners, interactivity wasn’t necessarily about the visual experience. Instead the word evoked a plethora of definitions that reflected a range of thinking

about creating meaningful museum experiences. Museum educators' definitions included "hands-on" and "minds-on," as well as criteria applied specifically to exhibits such as "something that produces a response" or "engages the senses and requires you to ask questions." In short, museum educator definitions had little to do with being visually enticing as required by television. *DragonflyTV* staff learned to use the term interactivity judiciously and found alternative language for describing the kinds of experiences they wanted to capture on television.

Additional discussions suggested other differences in the ways in which television producers' and museum educators' ideas about science education were shaped by the mediums in which they worked. Television producers were looking for action-oriented scenes, like roller coasters and hot air balloons, and were concerned with the activities of the children on screen. Museum educators' ideas about interactivity—in the sense of hands-on activities—centered on the learner or television viewer. They thought of the television viewer as passive, rather than active or interactive. Many were frankly dismissive of the potential for interactivity in television. They described television as a "one-way medium," one that "can never create dialogue," and a medium that can only "tell a story about science inquiry," rather than provide an authentic experience of inquiry. For many museum educators, interactivity would only be achieved if viewers were motivated to take action after watching.

While *DragonflyTV* staff agreed that one of intentions of the show is to motivate viewers to reproduce activities or conduct their own inquiries at home, the TV staff also argued, following the notion of interactivity as "minds-on," that the intellectual engagement in viewing was itself interactive.

### **Collaboration and Learning: Building a Richer Landscape**

The impact of the collaboration manifested itself differently for media and museum partners due to the nature of the partnerships themselves. For the museum professionals, the project involved a singular, albeit intense, collaboration with one television production. Few of the museums had immediate opportunities to apply what they learned working with *DragonflyTV* to collaborations with other television programs. In contrast, the television producers moved from one collaboration to the next. As such, they were able to integrate what they learned on an ongoing basis. In interviews conducted shortly after completion of the television segments, museum partners reflected on what they'd learned and how to put it into practice. Many were already thinking about how to extend inquiry experiences in their institutions. They also talked about how to integrate media in meaningful ways—in some cases, media that they had previously eschewed in favor of face-to-face experiences. In some cases, museum partners were planning new media projects and collaborations with, for instance, local PBS stations.

Most of the museum educators ultimately embraced *DragonflyTV* as an effective means of depicting inquiry. Some were interested in using the *DragonflyTV* segments to model the whole inquiry cycle as an introduction to hands-on activities, or with groups who had insufficient time to conduct full investigations. In some cases, our interviews led to discussions about the value of the television medium for presenting a full-inquiry cycle, including the ability to condense time as well as space. Other museum educators continued to struggle with what they saw as a diluted view of the process or the content in the television segments about inquiry. Television producers, in contrast, could immediately use what they learned from each collaboration experience and apply it to the next. They learned about the pacing of museum work, how to navigate large and small institutions, and about the richness and diversity of informal learning institutions and their educational offerings. They recognized that museums offer varying opportunities for inquiry, ranging from the limited experiences of an exhibit to the more extensive opportunities that allow visitors to experience firsthand the discipline, repetition, and sometimes "messiness" of the inquiry process as well as the satisfaction of new findings and observations. Within the limitations of a seven-minute investigation segment, *DragonflyTV* producers did include many of these aspects of inquiry.

Beyond that, the representation of museum experiences on *DragonflyTV* became more varied and more nuanced. For instance, the television producers earlier had avoided the inclusion of adults in favor of presenting “real kids doing real science.” Museum partners stressed the importance of educators and floor staff in providing face-to-face contact with visitors for fostering both interactivity and inquiry. And in a separate study, children queried about their responses to the show suggested that this omission presented an inauthentic view of museum experiences. In response, the second GPS season acknowledged the important roles adults play as resources for learning in informal science institutions. Producers found ways to include adults playfully in the investigations, without taking away from the central role of the child investigators. Thus, museum educators, park rangers, and other adults were shown providing safety instructions as well as helping child investigators identify research sites and use scientific equipment.

For most of the museum partners, the *DragonflyTV* collaboration was ultimately an exciting opportunity. They saw the potential of extending their own mission—that of engaging young audiences in science education—through a new medium and beyond their own local borders. *DragonflyTV* producers appreciated the input from science centers with respect to ideas, stories, and locations, which they would not have considered otherwise. The *DragonflyTV* staff also exploited their partners’ diverse resources and offerings as they worked with a succession of institutions—for instance, building on the scientific expertise within the institutions, using exhibits as the basis for an inquiry, and integrating museum staff in various ways.

Ultimately, as the final product in this collaboration was a television series, museum educators were often asked to operate within the TV culture. This meant being flexible and accommodating the fast-paced production schedule in the weeks leading up to and during shooting. Museum partners, accustomed to juggling multiple projects at any one time, were often caught off guard by the need to focus solely on the collaboration for this brief period. At the same time, *DragonflyTV* staff learned the value of clear, open communication, and to expect to provide a bit of training—and do so with patience—about aspects of television production that to them seemed common sense, such as explaining a “casting call.”

In a few cases, museum educators continue to grapple with the ways in which their ideas about inquiry as well as their institutions were packaged by *DragonflyTV*. The show’s snappy pace and fast-cutting, preteen aesthetic is tailored to what the broadcast industry considers necessary for engaging viewers and preventing them from turning to the multitude of alternative channels. At the same time, the show did develop an increasingly nuanced representation of museums and museum learning over the two seasons.

Further reflection on the collaboration, however, suggests that a single television show presents a limited view of the possibilities for using media for science education. In fact, the many modes of inquiry possible in the museum setting have parallels in the world of media. To see this, one must look beyond the specificity of *DragonflyTV*, both in terms of its particular genre of children’s science television and its broadcast television format. For instance, a documentary film detailing the history of the telescope or investigations of life on other planets, or a large-format film on how paleontologists learn about dinosaurs, might offer a very different view of inquiry. The plethora of audiovisual screens and formats now available for informal science education, from iPods to IMAX; varying abilities for users to stop, start, and review media; different opportunities for social and solitary screening; and emerging opportunities for user-generated content all present distinct opportunities and limitations for science education.

### **The New Landscape of “Convergence”**

In the media world, the term “convergence” is generally used to refer to the intersection of traditional

film and broadcast media with computers and the Internet. While museums and television are very different in the traditional sense, the new landscape of “convergence” has the potential to bring them closer together. Museums are increasingly incorporating technology into their exhibits and experiences, and many are developing a web presence equal to their real world offerings.

The *DragonflyTV* collaboration between media and museums offered a chance for professionals to understand more fully how informal science education is conducted in another industry and to learn a new set of tools. Many of the *DragonflyTV* museum partners valued what they had learned about media production, whether it was a first experience with the amount of shooting time for each minute of television, or grappling with the very concrete nature of television stories, limited opportunities for explicating content, or opportunities for modeling behavior. Many were pleasantly surprised at the recognition of a shared mission between themselves and *DragonflyTV*, making them more open to the value of television as a medium of science education. To varying degrees, they appreciated the ability of television to communicate aspects of the inquiry process. In these various ways, they felt that the collaboration would prepare them for future media partnerships, and help expand the role of media within their institutions. These collaborations offer important opportunities for both television and museums, which can only expand and increase the impact of informal science education.

*Alice Apley is a Research Associate at RMC Research Corporation in Portsmouth, New Hampshire.*

This work is based on a series of evaluations of *DragonflyTV* conducted by RMC Research, in Portsmouth, New Hampshire. RMC Research completed a total of four evaluation studies on the *DragonflyTV Going Places in Science Series*, including [two phases of the Collaboration Study](#), and a [two-phase Children’s Viewing Study](#). Complete evaluation reports are available on [InformalScience.org](#).

[Return](#) | [Print](#)

This material is based upon work supported by the National Science Foundation under Grant No. DRL-0638981. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

- [© ASTC - Association of Science-Technology Centers](#) |
- [Terms of Use](#) |
- [Privacy](#) |
- [Design by Ideum](#)