



**Using Video in the Science Classroom:
Report on a four-month study of teachers' use of
DragonflyTV videos and Educator Guides**

Executive Summary

2006

ROCKMAN *ET AL*

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Starting in January 2006 ROCKMAN ET AL conducted a twelve-week study of the use of the PBS science series, *DragonflyTV*, in twenty middle grade science classrooms. *DragonflyTV* is a PBS science series that models science inquiry by presenting real children conducting inquiry investigations into their own science questions. The goal of the TV series is to illuminate the inquiry process and inspire viewers to conduct their own investigations. The participating teachers were provided with DVDs of 36 *DragonflyTV* programs, an index with National Science Education Standards correlations, and associated Educators' Guides. The teachers committed to using the videos each week, kept logs of their activities, and were surveyed and interviewed by the researchers.

The study focused on three primary research questions:

- 1) How and why do Middle School Science teachers use educational video in their classrooms?
- 2) How and why do Middle School Science teachers use *DragonflyTV* programs or segments, and the associated Teacher's Guides and Web in their classrooms?
- 3) What are the resulting impacts of video use on students?

General Findings

What was most striking about the study, even with its small population, was the great variety in how teachers used the video materials and in the effect those usage patterns had on their students. The most notable variations occurred in the timing and purpose of video and in the pedagogical techniques teachers used with the videos. Teachers used videos to introduce new content areas at the beginning of a lesson and also used videos to demonstrate or reinforce concepts at later points in instructional units. In both cases, students generally seemed to enjoy the opportunity to view videos, often preferring them to other instructional tasks.

Teachers' use of the *DragonflyTV* videos also varied significantly. Some teachers sought to capitalize on the videos' strengths for entertaining and engaging students – in these cases the videos were shown as a reward or as a means of motivating students. Some teachers built on the inherent, inquiry-based design of *DragonflyTV*, adopting an approach to viewing that engaged students in inquiry as part of the viewing experience. Teachers found the style of *DragonflyTV* program segments to be a particularly good fit with this active, or inquiry-based style of video use, particularly among students in the target audience for the program. Furthermore, teachers found this approach to be highly effective in fostering both engagement and science learning.

Trends in Video Usage

In spite of variations in how participants used videos, there were some consistent trends that emerged for outcomes of video usage. Study findings suggest that the use of shorter, more targeted video segments yields greater learning outcomes and maximizes the benefits of limited instructional time spent watching videos.

Teachers also expressed a need for supplemental guides and indexes to make television programs that are created for broadcast and viewing at home useful in the classroom. Videos should be correlated to science curriculum standards, at the local level if possible, and clear descriptions should be provided, either in a printed guide or on a Web site. Activity guides should be designed for ease of use and include student worksheets. A complementary Web site with additional content for students and for teachers is also of significant value in the classroom, to the degree time in school allows for Web use.

Strengths of *DragonflyTV*

The study also highlights unique strengths of *DragonflyTV*. Because children today arrive at school with strong preferences for commercially-styled video, *DragonflyTV* videos seemed to be particularly appealing. Students respond well to programs to which they can relate, and to those that incorporate up-to-date video style and *DragonflyTV*'s fast-paced editing, innovative camera angles and popular music seemed to meet the expectations of today's media-literate students. Teachers consistently ranked *DragonflyTV* video segments higher than other videos that had been used during the week and teachers often commented on how engaged their students were while watching the *DragonflyTV* videos.

Teachers also offered praise for *DragonflyTV*'s ability to teach and reinforce concepts related to the process of scientific inquiry. Several teachers noted long-lasting effects in how students approached inquiry exercises after viewing *DragonflyTV*. Furthermore, comments made by both teachers and students in this study suggest that students make connections between science and real life and that they grow more interested in science and scientific inquiry as a result of viewing *DragonflyTV*.

On a student survey conducted at the end of the study, 77% of students noted that *DragonflyTV* helped them with their science experiments. Students specifically commented that *DragonflyTV* had helped them do better science fair projects or science projects for class assignments. Teachers cited examples of students' answers on tests and assignments improving as a result of viewing *DragonflyTV*—explaining that students demonstrated a better grasp on the parts of the scientific process and wrote more complete and clear responses to open-ended questions that asked them to describe results of scientific investigations.