Interactive Video: Reviewing Science, Stereotypes, and Society

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Matthews, C. (1994). Interactive Video: Reviewing science, stereotypes and society. *The Science Teacher, 61* (3), 20 - 23.

*****Note: Figures may be missing from this format of the document**

What would your students think if they were shown a video clip of a disheveled old man, playing the bongos and chanting "...gotta have my orange, orange juice!"? My students have suggested that the drummer is a homeless person, a crazy man, a very poor drummer making a fool of himself, or a man who obviously enjoys what he is doing. "He's cool and doesn't seem to have any cares about what people think."

What if that fIlm clip is followed by one in which he talks about a country called Tanna Tuva while accompanied by very strange music (students have said it sounds like a person singing into a fan) and this same old man says he wants to go to Tanna Tuva because someplace with a capital called K-y-z-y-l has just got to be interesting? The next image we see is a car with a California license plate that spells out the word "TUVA."

Some students now think he may be a musicologist. Other students suggest that perhaps he is an anthropologist. A few students still think he is just an insane old man.

After a few more video clips, during which the viewers learned that the drummer played for a percussion ballet in Paris and translated documents from Tuvan to Russian to English and vice versa, students were convinced that the videotape is about an anthropologist.

Our featured character then begins to talk about jokes and puzzles. "You see, I like to kid by making up countries that don't exist...I love puzzles." He translates one of the Mayan codices for fun, and explains, "I knew it had all been done before. I just wanted to see what it would feel like to figure it all out myself." At this point, my students were fascinated with the "crazy old man."

The old man then reveals that he is not fond of honors. Not just any honors, mind you, but he says that he resigned from the National Academy of Sciences and that, although he won the Nobel Prize, it is a pain in the neck. Very few students recognized Dr. Richard Feynman, said by some scholars to be the most important physicist this century. However, the demeanor of students changed dramatically.

We were no longer talking about a homeless person, a crazy man, or an anthropologist. We were talking about a Noble Prize-winning physicist. Suddenly, the perspective from which students had viewed previous video clips changed. Several students perked up and became much more interested after Feynman expressed his disdain for honors. Many shared his feelings ofdislike for honors at school and expressed an alliance with Feynman in this regard.

One video clip features Feynman's work as a member of the Space Shuttle Challenger Disaster Investigation Team during which Feynman announces to NASA:

FIGURE 1. Other suggested films.

Gaia: The Living Planet: A Portrait of James Lovelock, 44 min., $350.00, Bullfrog Films, Inc., 1990.
Reflections on a Life in Science (Dr. E.O. Wilson), 65 min., $39.50, Harvard University Press, 1989.
The Life and Times of David Brower, 58 min., $250.00, Bullfrog Films, Inc., 1989.
Magnificent Obsession: The Life of Edward Teller, 28 min., $49.95, Carolina Biological Supply Company, 1991.
Marching to a Different Drummer: The Life of Jonas Salk, 28 min., $49.95, Carolina Biological Supply Company, 1991.

The following are 30-minute videos in *The Eminent Scientist Series* produced by Carolina Biological Supply Company, and are available for $49.95 each. These videos are available individually on videotape and will soon be available as a compilation along with *Magnificent Obsession: The Life of Edward Teller* and *Marching to a Different Drummer: The Life of Jonas Salk* on Compact Disk Interactive (CDI).

A Conversation with Stephen J. Gould, 1988
Richard Leakey: Looking Ahead to the Past, 1988
Jane Goodall: A Life in the Wild, 1989
Francis Crick: Beyond the Double Helix, 1989
From Atoms to Asteroids: A Life of Philip Morrison, 1988
Stephen Hawking: The Universe Within, 1989
Linus Pauling: A Century of Science and Life, 1987

I took this stuff that I got out of your seal and I put it in ice water, and I discovered that when you put some pressure on it for a while and then undo it, it doesn't stretch back. It stays the same dimension. In other words, for a few seconds at least and more seconds than that, there is no resilience in this particular material when it is at a temperature of32 degrees. I believe that has some significance for our problem."

At this point one of my students finally recognized. The young woman quickly jumped to her feet and announced, "I know who he is. I saw a television program several nights ago on the Challenger Disaster, and he was there."

One student responded that this man could not be a scientist because he did not act, look, or talk like any scientist she had ever met or been exposed to. Scientists worked in laboratories, wore white laboratory coats, and used a lot of big words, and "stuff' didn't qualify as a big, scientific word. Feynman's imprecise language led many students to believe that he was not a well-educated person.

Surprisingly, students responded openly to this series of video clips and were willing to share their gut-level impressions with other members of the class. However, at this point, none seemed to understand why we were engaged in this kind of activity.

INTERACTIVE VIDEO VIEWING

Video viewing is typically considered a passive experience for students and an opportunity for direct instruction by teachers. Information is conveyed, and students are expected to receive this information and assimilate it into their cognitive frameworks as responsive learners. Some teachers will prepare students with an outline, a list of questions to answer, or the requirement to summarize important points in the film. Teachers may pause the fIlm periodically to discuss what students have just seen or may give a follow-up quiz to ensure that students pay attention.

Inquiry-oriented, interactive video viewing can turn an expository teaching situation into an opportunity for inquiry learning by altering the sequence of a video, encouraging written responses to a series of video clips, and initiating class discussion after each written response.

In *Teaching Strategies,* the authors describe inquiry:

Inquiry processes require a high degree of interaction among the learner, the teacher, the materials, the content and the environment... both student and teacher become persistent askers, seekers, interrogators, questioners and ponderers and ultimately pose the question that every Nobel Prize winner has asked: I wonder what would happen if..? It is through inquiry that new knowledge is discovered. It is by becoming involved in the process (of inquiry] that students become historians, scientists, economists, artists, businesspersons, poets, writers, or researchers—even if only for an hour or two in your class. "(Orlich, 1990).

The NOVA video, *The Last Journey of a Genius*, which is the basis of this activity, begins with a narration that answers the "five W's"—who, what, when, where, and why. We learn that it is about the life of Dr. Richard Feynman (who), 1919-1989 (when), a Nobel Prize winning physicist (what), who dreamed of visiting a remote, independent country in Russia that he remembered from a stamp he and his father had admired when Richard was a child (where and why).

During this brief introduction, the narrator answers the five W's to provide viewers with an outline for the video they are about to watch. Viewers are then poised to assimilate information into the framework provided during the introduction. They have their learning objective, and their educational mission is clear. There is certainly nothing wrong with this mode of presentation: information is conveyed effectively and efficiently to willing learners. I intend for students to come away from this experience knowing the answers to the five W's, but I also want them to feel like they know Richard Feynman and recognize and value his achievements. I want them to become more knowledgeable about the work of physicists and to have a more positive view of scientists as people. I want them to become enamored with the ideas of inquiry, exploration, and curiosity, and to understand some of what Feynman is saying. From this particular activity, they can learn about the Mayan Codex, the periodicity of Venus as a morning star, and the existence of a country called Tanna Tuva. But the way that they feel about this experience is as important as what they later remember about Feynman.

I give students minimal instructions prior to the viewing and do not show them the introductory narrative. They are told, however, that they will respond in writing to a series of video clips and will then share their observations during a class discussion. Students share their feelings, impressions, and reactions with their classmates by talking about the clips or reading their responses aloud. The teacher makes few comments other than to elicit responses from each class member and to point out obvious differences in interpretation of the same clip. Students immediately realize different ways of knowing as evidenced by the range of comments that are made about the first few clips.

CONCLUSION

Not only did my students learn about physics and a physicist, they also learned to confront stereotypes. Students shared their gut-level reactions to clips of an old disheveled drummer who wrote and performed percussion music for a ballet and dreamed of visiting Tanna Tuva because it had a capital with a funny sounding name. Students' traditional, narrowly defIned notions of what scientists are and do were shattered as they watched the video clips.

Science educators are interested in engendering students with positive attitudes toward science. According to Shrigley, in Majumdar (1991),

`Attitudes are learned which means that they can be taught, and information is the driving force. Factual information... has only a negligible effect on science attitudes. Personal and immediately relevant information influences science attitudes. Discrepant investigations, those that surprise, baffle and then delight students, motivate positive attitudes toward classroom science."

Inquiry-oriented, interactive video viewing is an example of a discrepant experience that has resulted in students viewing scientists more positively. In my activity, students came to feel an affinity for the old drummer as they made a personal association between themselves and the scientist.

Many classroom viewing experiences were followed by a showing of the entire NOVA program (60 minutes long). Some classes continued their Feynman studies by reading his books and duplicating simple experiments they read about. Other classes read about and reported on other award winning scientists.

Students were moved by the experiences that they had shared with Feynman through the video. Their stereotypical views of scientists were shaken as the experience challenged them to confront their beliefs. Inquiry-oriented, interactive video viewing can provide the avenue for educational investigations into the practices of teaching and learning.

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NOTES

The NOVA video used in this activity is no longer commercially available, but may be found at local or school libraries.

The author is continuing her research in this activity using the Feynman video. If you are interested in participating in the study, please call her at the University of North Carolina at Greensboro, 910-334-5100.

ACKNOWLEDGEMENT

The author expresses sincere appreciation to Katherine Young, Boise State University, and Susan Jenkins, sixth grade teacher at Cynthia Mann Elementary in Boise, Idaho, for their assistance with this project.