

# *World* of **VIRUSES**

## **Formative Evaluation Report**

### **Trial Testing of Graphic Story, Cartoon Panel, Podcast, and Essay**

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**World of Viruses**  
**Formative Evaluation of Educational Materials:**  
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**Spiegel, Struthers, & Carpenter**  
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**Introduction**

World of Viruses (WoV) is an educational project funded by the National Center for Research Resources at the National Institutes of Health through the Science Education Partnership Award (SEPA) Grant No. R25 RR024267-01 (2007- 2012). WoV was funded to develop radio documentaries and features for public and satellite radio stations; these products are complemented with a sophisticated outreach package for public libraries, educators, and middle and high school students. The planned educational package now includes essays, graphic novels, and cartoon panels, in addition to the radio documentaries, all of which address a variety of virology topics.

The World of Viruses formative evaluation of these educational materials was designed to gather feedback from the target audience for these pieces. Detailed information about how youth reacted to the different pieces, how the pieces work together, and how they might be improved will be provided to the developers and project staff to inform decisions about design and future directions for materials development.

**Methods and Participants**

Five separate focus groups were conducted for the purpose of gathering feedback on drafts of the educational materials developed for the World of Viruses project. Participants were given about fifteen minutes at the beginning of their session and asked to read, look at, or listen to the four types of materials under study. They were also asked to make written notes during this time, recording their impressions of “what works” and “what doesn’t work” about the materials. For each session, the moderator then brought the individual focus group together and asked questions, first about participants' overall impressions of the materials, and then more specific questions about the individual pieces. Each focus group session lasted about one hour. Midway through the data gathering, an informal verbal feedback session was held with the project Principal Investigator (PI). This led to a slight modification of methods so that more individual quantitative information could be gathered. As an addition to the verbal comments, students in the last three focus groups were asked to individually rate and rank each of the four formats as part of their written feedback. These additional data allowed the materials to be directly and quantifiably compared to each other.

All participants were high school students at a Lincoln, Nebraska public school, enrolled in a required freshman science class or a member of the student council. This high school has a 38% ethnic minority enrollment, with 52% of the student body participating in the free or reduced lunch program. A total of 30 students (11 females and 19 males) participated in the focus groups. The majority were 14 to 15 years old, with a few students slightly older.

This study was approved by the University of Nebraska-Lincoln Institutional Review Board prior to data gathering. All students and their parents furnished written consent, and students were given a \$10 cash incentive to participate. The focus groups took place in a science classroom during normal school hours.

### **Description of materials**

Four types of materials about human papillomavirus (HPV) were trial-tested in a focus group setting. These included a graphic story, a cartoon panel, a radio documentary (podcast), and an essay. Because of time constraints, the graphic story and radio documentary were excerpted, while the cartoon panel and essay were presented in full.

*Graphic Story:* This 20-page story features a girl (anthropomorphized HPV) who finds a place to live inside Dede, an Indonesian fisherman whose immune system is suppressed because of a rare genetic defect. The resulting warts multiply and become disfiguring, causing Dede to be unable to work. He becomes known as “the terrible Tree Man.” Eventually, a physician is able to treat Dede’s HPV infection and reduce the tumors, and HPV girl is forced to move on.

The first seven pages of the graphic story, in which HPV girl moves into her new “home,” were stapled together to make a booklet. For the first few focus groups that were conducted, only black-and-white copies of the graphic story were available. When colored versions of the cover and the first two pages were produced, these were tested in the last set of focus groups.

*Cartoon Panel:* Fourteen single-panel color “cartoons” about HPV were arranged into a one-page collage. Each cartoon (except one) included a brief heading, a drawing, and a short text with humorous, unusual, or interesting facts about HPV. Cartoon headings included “Famous Warts,” “Stealth Invader,” and “A Cure for Cancer?”

*Podcast:* This three-minute excerpt was selected by SoundPrint personnel from a longer, twenty-eight-minute audio piece about HPV called “The Shy Virus.” Criteria for segment selection were outlined by PI Judy Diamond: a segment should include a description of some aspect of the virus, should be narrated by a research virologist, and could be understood on its own despite having been extracted from the context of a longer piece. The SoundPrint staff selected a section in which Dr. Peter Angeletti describes the replication process of HPV, an aspect of the virus that meets one of the project’s four learning outcomes in regard to virology.

*Essay:* The five-page essay by Carl Zimmer was mocked up into a color “magazine” with a colorful cover and pictures inside featuring scientific illustrations of HPV, as well as photographs of animals and other images related to the text. This was the most detailed and informative of the materials that included written text, offering specific information about how the virus infects and replicates inside a host, along with some historical and current research on HPV.

### **Use of public libraries and media**

All the students in the focus groups reported that they use the high school media center on a regular basis. When asked about their use of the public library, the majority of students said they had not visited any public library within the last year. However, a few indicated that they use their local library regularly, about once a week, and a few use it less frequently, about once a month.

Over half of the students own MP3 players, but none use their devices to download podcasts. They use their MP3 players exclusively for music.

### **Overall reaction to the materials**

All four types of informational materials were received mostly positively. On average, in the ratings that students completed, none of the materials fell into the “dislike” category. However, the feedback was diverse. Each of the formats (podcast, graphic story, cartoon panel, and essay) was ranked #1 by two or more of the participants, and each was also ranked last (#4) in comparison to the other materials. One student really liked the essay because of all the “relevant information,” while another student found that the graphic novel was most appealing, with the main HPV-girl character who was “just looking for a place to live.” Another student thought the podcast was most interesting, because “I don’t like to read.” And, for yet another student, the cartoon panel, because of its short paragraphs, was “the best.”

Overall, the students liked the color and eye-catching pictures in all the visual materials. Many were surprised to learn that HPV is a virus that causes warts, and that “you could have it for years and not know it.” Some found the graphic novel and the essay too lengthy, and preferred listening to the podcast. Others found the background noises in the podcast distracting and too loud. Across all groups, the graphic novel was clearly identified as the most appealing of the materials presented.

### **Graphic Story**

*Strengths:* Students felt that the graphic story worked because of its pictures and its interesting narrative. They said they liked the way the pictures were so detailed and made the material easier to understand. The story helped “lead them through” the information; they were impressed that they were able to learn and enjoy the story at the same time. They felt it was “different” and “something fun that a lot of teenagers might like.” Several students identified with the “lady virus” storyline taking place inside a body, and “how it talks about how she just wants a nice comfortable place to live, like [we do].” They also enjoyed the “Tree man” story, which most had never heard of before.

Students described the purpose of the graphic story as a way to “grab your attention.” They felt it was meant to inform, but also to entertain. One student mentioned that it presented the facts in a fun way. When asked, several students said that they would share this with a friend, and agreed that it could be helpful in a school project about HPV.

*Suggestions for improvement:* Some felt that it was too long and that the story was not always successful in explaining exactly what HPV is. Some thought it was designed for a

younger age group, and was too “make-believe.” One student suggested larger writing would be helpful. Students in the earlier focus groups mentioned the need for color, an important feature; this was no longer an issue in the latter focus groups when the story was available in color. Some students, in particular those who don’t usually read graphic stories, felt it was unrealistic and a little confusing in format, because “you don’t know where to start.” Another student suggested adding some poetry.

*Overall rankings and ratings:*

When compared to the other materials, the graphic story was given the highest rating and ranked above the podcast, cartoon, and essay. Forty percent of the students providing ranks and ratings identified this piece as their favorite. Still, 13% ranked it last, behind all the other materials. Overall, the students felt the text was very informative and easy to understand. In addition, they enjoyed the pictures, and felt the story kept their attention. One student stated, “The graphic novel was interesting, I really liked reading it.”

**Cartoon Panel**

*Strengths:* Students generally felt that the cartoon panel worked because it was “colorful,” had “cool pictures,” and was “easy to understand” and “pretty fast to read.” Students also liked that “it was funny.” They thought it presented the information well, had interesting, fun facts, and that they learned something from it. They enjoyed reading about different things; they liked that the cartoons incorporated both people and animals, and that real individuals were featured. One student mentioned she liked the one about “kissing the frog,” and another student said the cartoon panel was the most interesting of all the materials.

Students identified the purpose of the cartoon panel as follows: to inform with fun facts, to give information about HPV, to give information about warts, and to let the public know HPV is a real problem. Other students mentioned that HPV is very common, that it is in all species, and that there are many places to get HPV. One student thought the cartoon panel was like a pamphlet that you would pick up in a nurse’s office. When asked, some students agreed that they would recommend it to a friend as a way to learn about HPV.

*Suggestions for improvement:* Many students remarked that the cartoon panel’s layout made it confusing to know where to start reading, that it was difficult to follow, and that it “did not flow.” One student felt that it looked like a lot of reading. Suggestions included making the pictures and text bigger and separating them onto individual index cards or into a pamphlet that you could put in your pocket. One student suggested that it would be more interesting if it were scarier (“don’t make it sound so harmless”); another found the cartoons “childish,” but several others wanted even more humor included. One student found it confusing, complaining that “in one place it’s about warts and then in another it’s talking about cancer [without explaining the link].”

*Overall rankings and ratings:* In comparing this piece with the other three, students felt the cartoon panel did not provide as much information as the other materials. One student said that this is something he would read in a doctor’s office, or if he had to do research on a project. Based on results from the students who rated and ranked the materials, the cartoon

panel was rated in the middle, with 29% of students ranking this as their favorite, and another 29% ranking this as their least favorite.

### **Podcast**

*Strengths:* Some students really enjoyed the podcast. They felt it presented the information very well. One student had a strong response to the idea that the “virus entering the body is like going through an open door,” remembering and repeating it to the group. They appreciated that the voices were not boring, and that the terms that were used were easy to understand. Some students pointed out how much information was available through this podcast, and “if you actually listen, you can learn a lot.” Although most said they were more visual learners, some liked the idea of listening, rather than reading. One student described this as a “relaxing” way to get the information.

The purpose of the podcast was identified as way to raise awareness. The students felt the story was precautionary in that it presented what to do and what not to do. One student mentioned that it described how the virus gets in, and then how to prevent it. When asked, some students said they would suggest the podcast to a friend if he or she was interested in HPV.

*Suggestions for improvement:* The major complaint with this piece had to do with the sound effects. Although a small number of the students enjoyed this aspect, the majority found the sounds to be “distracting” and “annoying.” One student said “the noises in the background of the clip on the iPod touch thing were annoying, and at times I couldn’t hear the guy say the things that might have been important.” Some students had difficulty focusing on the spoken audio. Some participants who preferred visual materials suggested incorporating video or pictures, saying they were bored with it because there was “no video to show you what’s going on.”

### *Overall rankings and ratings:*

When asked to compare the four materials, the students ranked and rated the podcast in the middle with the cartoon panel. Twenty percent of students rated the podcast as their favorite, and 20% rated it as their least favorite of the materials presented. Overall, they liked it more than the essay, but less than the graphic story. This low ranking may be related to participants' overall lack of interest in podcasts. The majority of students did say they thought the information was “interesting” and “helpful” but that they normally “do not download podcasts” or listen to them on a regular basis.

### **Essay**

*Strengths:* Some students responded very positively to this type of learning tool. They felt it explained the subject well and was readable and informative. They liked that the essay was “realistic” and included facts about HPV. Several found the story about the jackalope particularly interesting. Some students mentioned that they liked the explanation of “how it was first started” and the descriptions of “how everything happens.” They also liked all the pictures. One student said he “loved the essay.”

The students identified the purpose of the essay as a way to inform and also warn. One student said its aim was to “describe what could happen if you get infected with stuff.” Some felt that this material could be useful in school projects.

*Suggestions for improvement:* Many students found the essay “boring” with too many big words, which were “confusing.” Some said it “felt like an assignment” and was “too long.” These students found it hard to stay focused enough to read the whole thing. Others commented that certain words needed to be explained or defined. As one student put it, “don’t make us feel stupid [using words we don’t understand].” Some suggested adding headings to separate ideas and bolding the headings that are already in place. Adding more pictures was also mentioned. A scientific drawing of HPV was included several times as part of this mocked-up pamphlet. When asked what the picture of HPV was, many students had no idea, so this image should be clearly labeled in future publications.

*Overall rankings and ratings:* The essay ranked lowest compared to the other materials, and 46% of students ranked it last. However, 15% ranked this as their favorite of all the materials. The majority of students thought it was too long, used too many big words, and felt like schoolwork. Although some acknowledged the essay was “full of good info,” most still felt it was “boring” and would not recommend the essay to a friend.

## **Conclusions**

The four formats of HPV materials appealed to and resonated with different students in different ways. Having a diverse set of materials was an effective means of reaching this audience. Students were able to describe key content points from all the materials; they regarded the four pieces as informative and useful for learning about HPV in interesting and fun ways.

Although all the formats were successful in reaching some students, the excerpt from the graphic story was the most well received of the materials. This format was especially appealing for students familiar with the genre. In order of preference, the students ranked the graphic story first, followed by the podcast and cartoon panel (tied), and the essay last.

## **Recommendations**

1. Continue producing these kinds of materials for this audience. The formats studied were all perceived as generally appropriate and mostly appealing, and they appear to have communicated the intended content.
2. Continue to offer multiple formats to this target age group. Because different approaches were effective with different students, a broader reach can be achieved.
3. Emphasize the graphic story and provide diverse and extensive dissemination for it. This was the most popular of all the formats and may provide a “hook” to pique students’ interest in the subject and willingness to explore the other materials.
4. Consider using the cartoons as individual postcards or panels to increase each frame's impact and accessibility.
5. Seek a variety of ways to provide access to the podcast. While this age group is unlikely to download the podcast, participants enjoyed listening to it and some

- indicated they would continue to listen if they were to chance upon it. In future productions, avoid distracting background sounds that detract from the content.
6. Consider formatting the essay to make it more accessible. Use additional headers and incorporate illustrations or photos. If the illustration of the HPV is included, even if it appears in an obvious context, be sure it is clearly labeled and identified.