Information Literacy

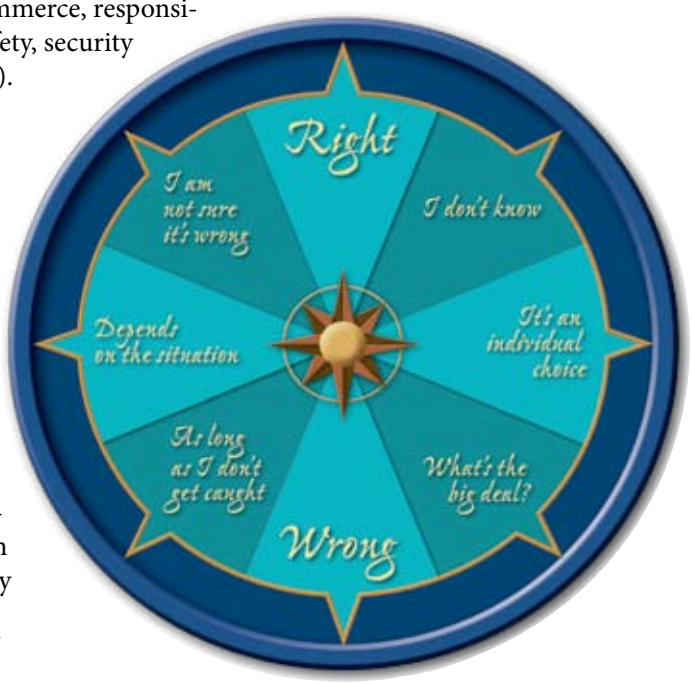
Digital Citizenship at All Grade Levels

By Mike S. Ribble and Gerald D. Bailey

Technology misuse and abuse has become a major problem in our schools. News sources are filled with headlines such as "Felony Charges for Computer-Abusing Kids" and "Tech Gadgets Challenge Educators." Hacking, cyberbullying, and inappropriate cell phone use are issues being dealt with in schools. What can educators do about the rising epidemic of technology-related problems?

Most schools have responded by instituting rules called Accepted Use Policies (AUPs). AUPs have had some effect on technology misuse and abuse in schools, but they have had little effect on teaching responsible technology behavior. We believe the answers to technology misuse and abuse lies in instilling knowledge, teaching thoughtful self-reflection, and creating established boundaries that allow students to understand how to use technology appropriately. Digital citizenship should be taught at all levels in the K–12 curriculum and integrated in all subjects.

What is digital citizenship? The norms of behavior for technology use. We have created several categories of digital behavior: etiquette, communication, education, access, commerce, responsibility, rights, safety, security (self-protection).



We teach our students to be good citizens, what their rights and responsibilities as members of our society are. In our opinion, we should all help students develop responsible behavior in digital society by engaging them in discussion of these categories.

There are four stages to enhancing understanding of digital citizenship: awareness, guided practice, modeling, and feedback and analysis. These stages provide a framework for helping students understand why it is important to be good digital citizens.

Awareness

Awareness means engaging students in becoming technologically literate. This stage goes beyond basic knowledge or information about hardware and software and focuses on examples of misusing and abusing hardware and software. Students need to learn what is and isn't appropriate when using digital technologies. (For other examples, see http://coe.ksu.edu/digitalcitizenship/.) Have them answer the following questions:

- Do I have a good understanding of how a particular technology works and how using it can affect me as well as others?
- Have I learned about the potential problems or issues related to using this technology?
- Could I use this technology in a way that is acceptable to my teachers, parents, and friends?

Use the Digital Citizenship Quiz on the next page to help students understand the differences between using technology and misusing/abusing technology. All nine themes of digital citizenship are identified (as well as an additional term that might make the concept more understandable for elementary students). Once students have taken the quiz, use the answers and explanations to help stimulate a discussion on the importance of digital citizenship.

Digital Citizenship Quiz

Digital Etiquette (Manners)

1. Having your cell phone turned on during school hours is:
   a. a bad idea because it disturbs others.
   b. necessary to keep in touch with my parents.
   c. not a big deal because everyone else does it.
   d. something I do every day.

Digital Communication (Messages)

2. How many people should you have in your IM Buddy List?
   a. as many as I can get.
   b. none.
   c. only close friends and family.
   d. anyone who will talk to me.

Digital Education (Learning)

3. When learning about technology in school, it is important for you to know:
   a. the rules for using technology.
   b. how to work with others when using the technology.
   c. what different technologies are and how they are used.
   d. all of the above.

Digital Access (Inclusion)

4. Students with disabilities:
   a. can't use technology.
   b. should have the same opportunities as others to use technology.
   c. are not able to understand and learn about technology.
   d. shouldn't have opportunities to use technology.

Digital Commerce (Business)

5. If your parents allow you to buy things on the Internet, you should protect yourself by:
   a. doing nothing because all Internet sites are safe and protected.
   b. doing nothing because your friends do it and that makes it okay.
   c. not telling anyone that you are buying things from theInternet.
   d. checking to see if the site is safe and secure.

Digital Responsibility (Trust)

6. When using graphics and text from the Internet, you should:
   a. use as many as possible.
   b. give the information to as many people as possible.
   c. give credit to the author of the information in the project.
   d. never use anything from the Internet.

Digital Rights (Privileges)

7. When using technology, you should:
   a. do whatever you want because no one ever checks.
   b. ask teachers and parents about what can be done.
   c. not ask permission because parents and teachers always say no.
   d. ask your friends because they know about technology.

Digital Safety (Protection)

8. How you work with technology (e.g., sitting, laying, stooping at the desk, floor, or sofa):
   a. doesn't matter as long as I am comfortable.
   b. depends on where I am.
   c. isn't something I need to be concerned about.
   d. is important because poor posture can cause physical problems later in life.

Digital Security: Self-Protection

9. When dealing with people online, giving personal information is:
   a. okay as long as these people live far away.
   b. never a good idea, no matter the reason.
   c. fine as long as the people are nice.
   d. nothing to worry about.

Answers

1: A. Many schools are allowing students to have cell phones in schools for safety, but are requiring that they be turned off or silenced during the school day. This keeps students focused on doing the right things in school.

2: C. Many students use IM at home and at school. Students need to be aware of who they are talking to (and what information they are giving) when using this communication method.

3: D. Technology affords many opportunities for students to learn beyond the classroom. But there must be an understanding of how to use the technologies first.

4: B. Students with disabilities should have opportunities to work and learn with technology. Some students may need special technology tools to provide this opportunity (e.g., screen readers, special input devices, speech to text converters).

5: D. Purchasing goods and services online needs to be taken seriously. People can gain information about you and your family from information that you provide. Make sure the site is secure by checking it over (e.g., does it have secure access only, ask only questions that are appropriate for the purchase, have alternate ways to contact the company).

6: C. Anything posted on the Internet has an owner who may restrict its use (unless stated otherwise). All content taken from the Web should be cited appropriately.

7: B. All users have certain rights and responsibilities when using technology. It is important to know what is and isn't appropriate.

8: D. Users often don't think about safe physical habits until they hurt themselves. How you use technology today can have a big effect on how you are going to be able to use it in the future.

9: B. It is easy to act differently online than face to face. Keep your private information private.

Guided Practice

Students should be able to use technology in an atmosphere where exploration and risk taking are promoted. Without this guided practice, they may not realize certain uses are inappropriate. You can use the following questions to help students reflect on how they use technology:

- When I use technologies, do I recognize when there is an issue of inappropriateness? Why or why not?
- Have I considered the appropriateness of my actions? Why or why not?
- Can I differentiate examples of technology misuse and abuse? Why or why not?
- What do I need to do to become aware of my actions when using technology?

Have students role-play situations where people are using cell phones in a public location (e.g., movie or theater). The role-playing should show conversations being conducted in a loud and obtrusive fashion. Pose the following question following the role-playing activity: "What would be the appropriate responses for both the user and people around them?"

Modeling and Demonstration

Explicitly model appropriate technology use in the classroom. For example, if you use a cell phone, turn it off or silence it during class. In addition, you can enlist the help of parents. Send the Digital Citizenship Quiz home and have your students discuss it with their parents. Adults need to be positive role models for being good digital citizens so children can follow their example.

All forms of technology use, misuse, and abuse have consequences. Students need to have an understanding of cause and effect. Ask students the following questions:

- Am I violating laws, policies, or other codes by using technology in this way? Why or why not?
- Have I seen, read, or heard of similar situations? What were the consequences?
- Does digital citizenship provide direction for determining the appropriateness of my actions? How? Why?

Have students discuss what is considered technology misuse and abuse in their school or district (e.g., examine their AUPs). Have students debate the different categories of technology use, misuse, and abuse or examples of appropriate or inappropriate use of technology in school.

Feedback and Analysis

The classroom should also be a place where students can discuss their use of technologies to see how they can use them more appropriately. Provide constructive criticism on how they should use the technologies in the classroom as well as out in society. The class should be able to analyze and explore why they should use technologies in a certain way.

It can be difficult to "go back" and think about one's actions after they occurred. But it is a necessary part of the process to decide if the student was correct or not. Without providing opportunities for self-reflection or self-contemplation, the inappropriate behavior will be repeated over and over in the future.

Encourage students to reflect on their actions and ask themselves the following questions about their technology-related behavior:

- Am I satisfied with my decision? Why or why not?
- Am I satisfied with the outcome of the situation? Why or why not?
- Did my behavior have a positive or negative influence on others? Why?
- Did I go back and evaluate how I used the technology later?
- Did I think about possible alternatives of how to use the technology?

Divide the class into small groups and have each group come up with strategies that promote thinking about using technology. Reconvene the class and have students compare strategies.

Conclusion

Digital citizenship needs to become a top priority for schools. Teaching digital citizenship as a "planned part of the curriculum" underscores the message that using technology is a privilege and not a right. Students need to see that being a good citizen is just as important in the digital world as in their community.

The time to start teaching digital citizenship is now. There is overwhelming evidence that technology misuse and abuse is widespread and can be found inside and outside the school. Students must learn what is appropriate and inappropriate, and that comes through discussion and dialogue—not just following a set of rules.

Standards: *NETS•S* 2; *NETS•T* II, III (http://www.iste.org/nets/)

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Social Studies

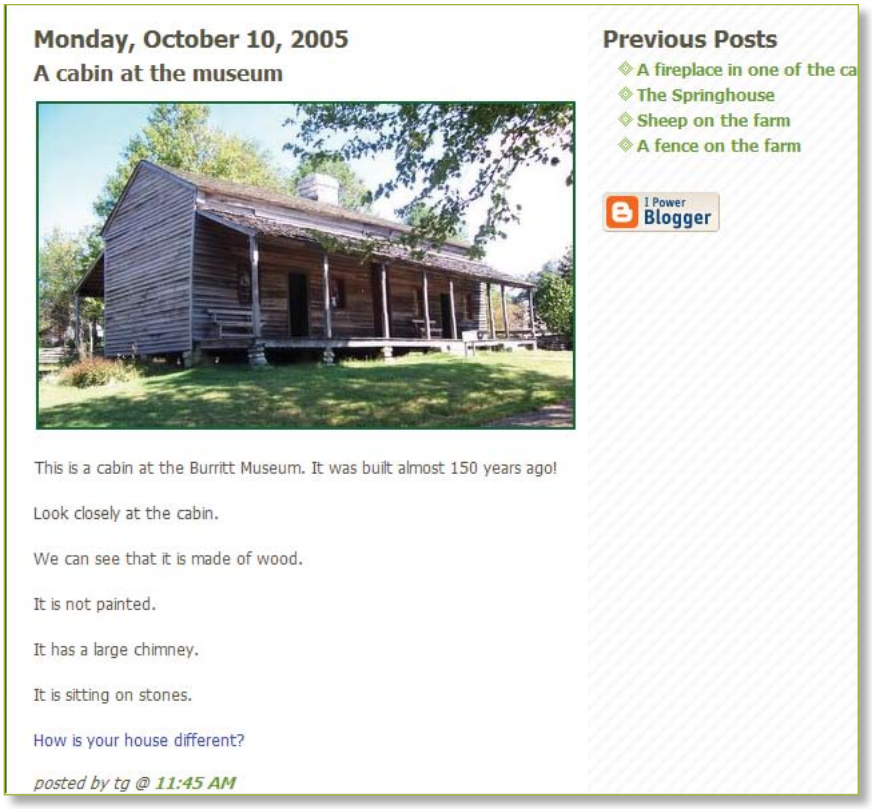
Go Blogging with Social Studies Field Trips

For more than a decade, teachers have been developing classroom Web sites to post information for students and parents. To integrate the Internet into social studies learning, we have planned scavenger hunts and virtual field trips to teach basic Internet research. Today we can add blogs to our Internet connection to the elementary curriculum. With traditional Web sites, teachers share information with parents and document units of study as well as provide an avenue for student publishing. Blogs, unlike traditional Web sites, provide teachers and students with the capability to type directly into a Web page using the browser. With the click of a button, ideas, classroom news, and social studies content can be published on the Internet in the form of a blog.

Blogs are often described as online journals that can be easily updated to reflect the thoughts and ideas of the user. With blogs, students are actively engaged in writing and reading. A blog is interactive—that is, readers can respond to an author by adding a comment. Blogging is a useful way for teachers to enhance social studies units. For example, when teachers use a blog to plan, organize, and document a social studies field trip, the project-oriented approach to using Web resources becomes highly interactive and meaningful for the students.

Field trip blogs begin with a unit of study. Like any instructional activity, planning is essential to successful learning. Field trip blogs can be used for real and virtual field trips.

Teachers can use blogs to introduce a planned field trip. Tim Gels, a preservice student at Athens State University in Alabama developed a blog to engage fourth graders in a field trip to the Burritt Museum in Huntsville, Alabama. Gels included digital photographs of the log cabins to prepare students for the field trip. In the blog, students learned how to respond to blogging text to compare life today with life 150 years ago. Tim's blog can be found at http://triptoburritt.blogspot.com/.



A screenshot from Tim Gels social studies blog.

Students can also blog to document learning from a field trip as well. Expository writing is encouraged in blogs when students learn to summarize details in descriptive paragraphs. For example, if a class visits Washington, D.C., teachers can assign sites such as the Lincoln Memorial or the Washington Monument to small groups to organize reflections from the field trip. Free access to a blog is available at http://www.bloglines.com/.

Finally, blogs provide potential teachers and students with links to Internet resources for virtual tours to unachievable destinations. Student blog projects document learning about places such as museums, historical sites, and natural environments. By using blogs to announce and organize classroom events, teachers link the Internet to the curriculum. Field trips will never be the same again.

Standards: *NETS•S* 3, 4 (http://www.iste.org/nets/). *NCSS* Curriculum Standard III (http://www.ncss.org/standards/).

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By Judy Britt

Science

Why Whyville?

By Cathleen Galas

Whyville (http://www.whyville.net) is an inquiry-based, learner-centered, online science community that appeals widely to adolescents between the ages of 9 and 14. Whyville was created in 1999 by science educators at Caltech who were interested in creating an online space for kids. The goal of Whyville is to create an engaging science environment to support exploration, communication, interaction, and science learning. The community has a political system, an economy, a newspaper, and interactive science games. Whyvillians (Whyville users) create their own unique identity, navigate through the community, chat with other users, and engage in science activities to increase their salary. Simulation and hands-on activities are key elements of the interactive science activities that link chemistry, biology, physics, and the history of science. Users can create elaborate avatars and visit the Spin Lab, the Whyology Center, WASA (Whyville Aeronautics and Space Administration), and many other science activities. Whyville has more than 900,000 registered users and 25,000 daily visitors. In addition, 67% of the users are girls, an unusual feature for a science education site.

Working with the owners of Whyville, Numedon Inc., my colleague at the University of California, Los Angeles, Graduate School of Education and Information Studies (GSEIS), Dr. Yasmin Kafai, and I were able to schedule an outbreak of an online virus called whypox as part of an NSF study on immersive, collaborative simulation environments. We conducted a pilot study in the fall of 2003 in my sixth grade science classes at the Corrine A. Seeds University Elementary School, the laboratory school for the GSEIS at UCLA. The research team included me; Kafai; Jen Sun, Numedon Inc.; and graduate students Linda Kao, Nina Neulight, and David Feldon.

Whypox

As users entered the site, they flew into Whyville Square, a busy place with many avatars representing users and word balloons over their heads as they chat. They learned to navigate around to Dr. Leila's, Smart Cars, the beach, get information, and communicate and interact with other Whyvillians. After they had time to navigate freely through Whyville and considered themselves part of the community, chatting, whispering, y-mailing, trying out science activities, and buying face parts, a few were suddenly confronted with an uncomfortable situation.

"Ms. Galas, there are red spots on my great new face!"

"My face, the new one that I just bought from Akbar's Face Mall, is turning gray, a really dull gray!"

The first reactions to the whypox were focused on appearance and social behavior. Students became annoyed that they couldn't chat—they would generate "ah-choos" above their head when they tried unsuccessfully to chat with others on the site. Spots began appearing on the faces of the users, and their faces became gray and unappealing. The spots and sneezing would increase for a few days and then fade. Then, they became concerned with how to behave around infected people, both to prevent themselves from becoming infected, and to help those who are already infected. In class, we discussed "What is happening in Whyville? What can we do about helping our community?" The whypox infection spread through our class and the rest of the online community, affecting some and not others.

As whypox spread through their class and other members of the online community, UES students began to discuss what was happening, what might happen, and how to control the spread of the disease. We charted the infections, and all data relating to infections, on a wall-sized data collection chart. The chart remained in the front of the room during the infection phase. Students became epidemiology detectives as they gathered data from classmates and others on Whyville to discover information about whypox. Students used sticky notes to add information as they or others became infected when at school or at home. We charted new infections daily, including the date of onset, symptoms, which class was infected, and with whom they came into contact. We consistently added new information and conducted ongoing analysis about the epidemic. Students asked each other "Where were you when you first noticed the spots? Where were you just before that? Who did you talk to that day? Do you know where they were? Oh, I saw that person you were talking to before you got infected, and they now have whypox!" The post-infection interviews resulted in flow chart formations of sticky notes and drawn lines all over the butcher paper as kids tried to make sense of how the infection was spreading. Discussion online centered on the question of why everyone was sick and what we could do about it. Classroom online and offline discussion and activities dealt with such questions as:

- Who is sick?
- What are the symptoms?
- When did they get sick?
- Where could they have been exposed?
- Why do some get sick and others stay healthy?
- What causes the sickness?
- What should individuals or the

Engage Students with Special Needs with Graphing Software

During a two-week period, students in a K–2 special education class engaged in an authentic problem-based activity in which they used The Graph Club to collect and graph information about the daily success of their school's food drive. Pairs of students worked collaboratively to count the number of cans collected that day in each teacher's food bin and then, using the classroom's computer, they entered the data into a table, generating a bar graph that was then hung in the classroom. For each graph generated, students discussed the data, making observations, and noticing trends. At the completion of the activity, the inservice and preservice teachers featured this real-life data collection activity on their class' home page (http://edweb.tusd.k12.az.us/gharty/cannedfood.htm).

The inservice teacher noted that although this same activity could have been done manually, the software "saved us much time in the creation of graphs" and enticed her autistic students to "stick to" completing the activity and "kept them from getting frustrated at their less-than-perfect graphs." Instead, they could "look at their perfectly created graphs and compare them" allowing them to "demonstrate the concept of more than and less than." Furthermore, "The students worked on objectives in the areas of communication, motor skills, math and language arts as they gathered, sorted, and graphed the cans." The preservice teacher who assisted in the implementation of this activity commented how the software provided the students the opportunity to "collect, compare, and quickly analyze the data mathematically, something they wouldn't have done as fast on their own." She further commented how the "software caught the kids' attention and the visual stimulation assisted them in getting involved and staying involved in the learning process. … I would have thought that the students would have had most difficulty understanding the mathematics, but I think they got it. I think the software helped."

Standards: *NETS•S* 3 (http://www.iste.org/nets/)

Special Needs

—Robin A. Ward, Assistant Professor, Department of Teaching and Teacher Education, University of Arizona, Tucson

community do when we find ways to prevent the sickness from spreading?
- Does the prevention method work? Why or why not?

Students investigated and searched for answers to try to determine how the whypox was introduced into the community and what could be done to prevent the spread of the disease.

Additional classroom offline and online curriculum in epidemiology supplemented the whypox online simulation. Students built individual "What is disease?" concept maps during the unit. Students regularly updated their maps as they gained new insights into the spread of disease. The maps became more sophisticated and detailed over time, becoming an assessment tool and artifact to observe the evolution of student understanding about epidemiology. Students researched topics about infectious disease and wrote articles for the Whyville Times. As students needed to know more about certain topics, articles, experiments, and activities from several sources were used to reinforce and expand their understandings.

Technology tools at the Whyville CDC authenticated our learning environment. At the CDC, students gathered information on the past whypox epidemic, interacted and shared insights via the bulletin board postings, and used graphing and visualization tools to analyze data and simulate infections and epidemics. Within the CDC, at Outbreak Headquarters, students read past and present case files submitted by users. At Whypox History, they read about the first whypox outbreak in 2002. Using the Infection Simulator, they could observe how infectious disease spreads in a population. In the second level of the simulator, they could control who got sick first and how many people each sick person infected daily. Using the Epidemic Simulator, students began to notice factors indicating whether an infectious disease could lead to an epidemic. They used the simulation tools to try to predict how long the epidemic would last, how infectious it was, and how many people it would affect. Cooperative groups ran many different simulations, changing one variable at a time to see the effects, and discussing and charting the results. As a class, we looked at the large area and fast spread of infection and studied the concepts of epidemic and exponential growth.

Our wall-sized data collection chart was the focal point of discussions of trends, adding information about when each person contracting whypox logged on, where they went, and with whom they came into contact. Students discussed trends and came up with hypotheses about ways to prevent one from catching whypox. Most often, they said to stay away from the beach. They noticed high rates of infection there, and many were sure that others at the beach had coughed on them, thus spreading the whypox virus.

Students all wrote group articles that were published in the Whyville Times on bacteria, viruses, spread of contagious disease, and documented the spread of whypox in Whyville. Each student also individually contributed to the postings of observations and data analysis from the infection and epidemic simulators. They added information and notes to the online bulletin boards to share information with the entire community, The CDC bulletin board had questions to help focus student discussion and thinking about the epidemic. Questions helped to focus the discussion on science and scaffold the students' thinking and problem solving about the outbreak of whypox. Some of the users were heavily engaged in trying to understand the dynamics of the disease.

Improving Students' Language Learning

Our Spanish textbook, like yours we're sure, has supplemental listening exercises on CD. These disks are excellent, except that the native speakers are speaking at a normal conversational rate, which leaves most students unable to keep up with the discussion. So we converted the audio tracks into MP3s and used PowerPoint's "Custom Animation" feature to insert the files into a presentation in which we placed the text being spoken. As the speakers converse, the script appears, similar to a karaoke machine, allowing the students to follow the conversation visually as they listen to the tracks.

The visual representation combined with the audio improved students' grades dramatically. Before using this technique, grades were generally in the lower 80s even after students listened to the track three or four times. Afterwards, students consistently received grades of 90 or better after the first viewing/listening. The higher grades continued to be present on quizzes and exams when they did not have the benefit of the visual props. Those students who participated in both forms, with visual cues and without, insisted that this format is much easier to understand and to retain.

Standards: *NETS•T* III (http://www.iste.org/nets/). *FL* 1.2 (http://www.actfl.org/).

—Lyn C. Howell, Assistant Professor of Education, Milligan College, Johnson City, Tennessee, and Robert Rose, Spanish Teacher, Andrew Jackson Elementary School, Kingsport, Tennessee

Foreign Language

Sixth graders became activists. They took to heart attempting to solve the real world questions about whypox and its spread through the Whyville community. UES students organized online groups dedicated to research, education, and philanthropy. They actively spread the word about ways to prevent infection, education, organizing a hospital and university as future educational and research centers. They took on different tasks to combat the spread of the disease within their online community. An outline of classroom science activities is available at http://www.ues.gseis.ucla.edu/teaching/curriculum/science/epidemiology/epidemiologyindex.html.

What Do Students Learn?

The simulation of whypox infection throughout the online community was a meaningful problem to solve, and an active, engaging way for students to build their own understanding about the spread of infectious disease. Whyville provided a collaborative environment by allowing students access to a larger community in which they could share data, communicate with knowledgeable individuals, and share resources. UES students, teachers, and online users as a community collaborated to think critically about the spread of whypox, gathering data about the online virus spread, making hypotheses regarding the spread and prevention tactics, and analyzing ongoing data to check the validity of their hypotheses. Whyville allowed students to participate in virtual science activities and study the whypox infection, both at home and at school. Many invested many hours outside of school at night and on weekends on Whyville. Students collaborated to help each other solve the real problem of the whypox epidemic. Students asked deep questions, researched answers, and took responsibility for their own open-ended learning. They were productive citizens of the community, and were given support to research, experiment, and contact experts to discover answers to their questions.

In Whyville, the community and science features blur the line between home and school, as students choose to participate actively in Whyville outside of school. Several students asked me to "assign" time on Whyville so that parents would allow them more time at home to be online. Frequently, students would call online class meetings at 6:30 or 7:00 pm in one of the checkers rooms. Anyone who was available would make the meeting and chat about whypox, epidemiology, or science homework. Girls and boys were equal participants in the science activities. Students were engaged, and many became passionate advocates to build a university and health science research center. Some became philanthropists, donating large amounts of clams, Whyville currency, to build a center for research and education. The collaborative online environment and the class cross-gender collaborative groups empowered students to investigate, question, gather data, hypothesize, and analyze data. This non-traditional science-learning environment provided a meaningful context for studying about epidemiology and problem solving. Students worked collaboratively beyond the borders of their classroom to investigate and solve the whypox dilemma in Whyville.

Standards: *NETS•S* 3, 4, 5; *NETS•T* II, III (http://www.iste.org/nets/). *NSES* Grades 5–8 A, C, F (http://www.nap.edu/readingroom/books/nses/html/).

Cathleen Galas was for many years a demonstration teacher/researcher at the University Elementary School in the Graduate School of Education and Information Studies at the University of California, Los Angeles. She is now consulting in the San Francisco Bay Area.

Call for Curriculum Submissions

Have you or a colleague taught a lesson or unit integrating technology that went particularly well?

Do you have:

- Tips, tricks, or tidbits?
- Stories or quotes that demonstrate student learning?
- A great tech tool or resource?
- Quick ideas easily adapted to other settings or content areas?

If you answered yes to any one of these, please call or write the editor with your ideas:

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