Using Websites Wisely

Online resources can deepen student learning—if teachers design the right tasks and learner supports.

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Not all informational websites are created equal. They range from static representations of content with few opportunities for interaction or support to dynamic, multimodal representations of concepts embedded within a pedagogically sound learning environment (Coiro & Fogleman, 2009). If used strategically, web-based learning environments can serve as tools for motivating, instructing, and assessing learners (Wijekumar, 2005). They can also facilitate peer interaction and extend thinking in a particular domain (Sadik, 2004).

We focus on three types of web-based learning environments here—informational reading systems, interactive learning systems, and instructional learning systems—framing our thinking about effective lesson design in terms of two crucial questions: What do you want your students to understand and be able to do? and How can web-based learning environments support your learning goals?

What Do You Want Your Students to Understand and Be Able to Do?
The first step in designing a lesson plan that includes a web-based learning environment is to clarify your learning goals. You might reflect on the following with a colleague: What are the big ideas in your lesson or unit? What common student misunderstandings might you expect? What key knowledge and skills will students acquire, and how will students demonstrate achievement of your desired results? Clarifying how students will demonstrate their understanding of your goals before you begin exploring websites will help you target (or disregard) particular websites.

The next step is to reflect on the efficacy of the methods and materials you typically use to teach this lesson. Which concepts are most challenging, and what types of learning scaffolds would enhance your instruction to better support students in demonstrating your desired results? In a math lesson about calculating the slope of a line, for example, do your materials represent algebraic concepts in multiple ways for learners who are more visual or auditory? Do students ever fail to grasp the ways that calculating the slope of a line might actually help them in the real world? Could parts of this lesson be more engaging in ways that enable students to manipulate and apply mathematical concepts in the context of real-life situations (as opposed to a series of equations listed on a textbook page)? Would students understand these concepts more deeply if they were represented in a different format—using images, video, animation, or simulations?

A clear understanding of how you might improve your lesson can inform
your selection of offerings from particular websites. In this way, you can engage students in meaningful online work and help them achieve your learning goals.

How Can Informational Websites Support Your Learning Goals?
A review of popular informational websites (Coiro & Fogleman, 2009) revealed at least three types of web-based environments that differ in purpose, types of multimodality and interactivity, and levels of instructional support (see “Using Websites to Learn,” p. 37). These differences have consequences for how a website may or may not support your needs.

Web-Based Informational Reading Systems
What They Look Like: Educational websites in the informational category often entice interested readers with engaging content, but they don’t necessarily provide scaffolding for students or teachers in how to use or learn from the information. Such websites present content-area concepts in primarily static, text-based environments, although some content may also be represented with clip art, photographs, or videos. Typically, readers navigate through the site guided only by their interest in or need to obtain information; few opportunities are available to interact with concepts other than by reading or viewing information.

For example, Discover (http://discovermagazine.com) features a lively collection of news articles about science, technology, and the future. The main menu links readers to multiple media sources, including short videos, photo galleries, and weekly podcasts that present science concepts in multiple formats. Within the articles, authors summarize research while presenting science issues as interesting topics to explore. However, the website is designed primarily to attract adult readers and science enthusiasts and to encourage people to subscribe to the print version of Discover magazine. Consequently, there are no explicit connections to education standards or lesson plans and no tips for how to navigate or use the website in a classroom context.

Awesome Stories (www.awesomestories.com) features a collection of multimedia primary source materials—for example, photos, video, audio, and historical documents—held together in a series of digital stories about films, famous trials, disasters, and historical events. A visit to one section about the Holocaust, for example, contains text embedded with hyperlinks that lead to a time line of important World War II events, a map of Poland, photos of political prisoners, and a virtual reality movie depicting the Auschwitz concentration camp. These multiple representations help learners grasp information in a variety of ways. But this website offers little guidance in how to help students navigate the stories or interpret the primary sources in ways that foster deep learning. The site offers lesson plans connected to some of the digital stories’ themes and plans to add 70 more lesson plans “soon,” which may address this issue.

How to Use Them: One strategy for designing lessons around websites that offer a wide range of information but little instructional support is to design a task that is focused on a small set of readings within the website and that aligns with your learning goals, offers reading choices, and scaffolds students’ understanding of important connections across the texts.

For example, a teacher who selects the Awesome Stories resource about the Holocaust (www.awesomestories.com/history/auschwitz) might include the digital story as part of a lesson designed to increase students’ understanding of the terrible ways in which people suffered during World War II. After a guided introduction discussing how different types of embedded media can offer additional insights not revealed in text, the teacher might give the following assignment:

- Read the digital story.
- Select four primary sources across several types of representations (for example, three photos and an audio clip) that most influenced your understanding of what it was like to be held prisoner at the Auschwitz concentration camp.
- Identify at least three ways people suffered in the camp, using evidence from the digital story and your selected primary sources.

Teachers can design a similar activity for students as they read an article at the Discover magazine website. The 20 Things You Didn’t Know About . . . series (http://discovermagazine.com/columns/20-things-you-didnt-know) offers an opportunity to focus students’
attention on a specific science topic (for example, fuel, water, viruses, or time) that the teacher aligns with an essential question.

For example, in a class studying the role that water plays in biology or earth systems, one essential question might be, Why is water essential to all life? As part of this unit, pairs of students studying the water cycle might investigate one of the facts from “20 Things You Didn’t Know About . . . Water” and report their findings to the class. By connecting to a popular science source, an activity. Typically, the information is related to a particular topic or discipline (for example, science, math, or history); but few explicit connections between features help learners (or teachers) connect one informational element to another in meaningful ways.

For example, Science News for Kids (www.sciencenewsforkids.org) is a web-based interactive learning system devoted to science news for children ages 9–14. The site features an Article Archive with static information that resembles offerings in the web-.com) is set up in a similar fashion but is designed to support learning that cuts across a range of content areas. Students can access reference material (an encyclopedia, a dictionary, an atlas, and several almanacs) as well as a digital information archive categorized by such topics as science, math, sports, and people. In a separate section, interactive games, puzzles, word searches, and quizzes provide practice with elementary math and language arts skills.

A key feature that moves this website from a reading system to a learning system is the Homework Center, which organizes information by subject area and connects students to subject-specific learning tools, such as a conversion calculator and a periodic table. The center links to the Fun Brain companion website (www.funbrain .com), which offers a Curriculum Guide that lists games by title, subject, and grade level, as well as a searchable Standards Finder. A teacher can select a topic—math, for instance—and a grade level—say, 2nd grade—and find a list of standards, several of which have games associated with them. For example, the standard “Uses trial and error and the process of elimination to solve problems” is associated with almost two dozen games that students can play. Thus, teachers can select specific online experiences for their students that match their desired learning results.

How to Use Them. One strategy for designing lessons that capitalize on the breadth of content offered on these sites is to encourage students to select a topic of interest on the site and decide how they will learn more about that topic. This task also addresses the Common Core English Language Arts Standards (Common Core Standards Initiative, 2010), which stipulate that all students should be able to independently and proficiently read a range of complex informational texts at their grade level in history, social studies, and science.

A teacher might, for example, present younger students with an independent reading guide for the Science News
Using Websites to Learn

Check out the following websites, which range from solid informational systems for readers to dynamic instructional systems for learners.

**Web-Based Informational Reading Systems**
- Awesome Stories (www.awesomestories.com)
- Discover Magazine (www.discovermagazine.com) and 20 Things You Didn’t Know About... (http://discovermagazine.com/columns/20-things-you-didn’t-know)
- Math in Daily Life (www.learner.org/interactives/dailymath)
- The History Place (www.historyplace.com)

**Web-Based Interactive Learning Systems**
- Science News for Kids (www.sciencenewsforkids.org)
- FactMonster (www.factmonster.com)
- OLogy (www.amnh.org/ology), from the American Museum of Natural History
- Cells Alive (www.cellsalive.com)
- America By Air: Smithsonian National Air and Space Museum (www.nasm.si.edu/exhibitions/gal102/americaabyair/index.cfm)
- The Big Myth: A Study of World Creation Myths (http://mythicjourneys.org/bigmyth/index.htm)
- BBC History: Interactives, Games, and Virtual Tours (www.bbc.co.uk/history/interactive)
- Windows to the Universe (www.windows2universe.org), from the National Earth Science Teachers Association
- National Geographic Creature Feature (http://kids.nationalgeographic.com/kids/animals/creaturefeature)

**Web-Based Instructional Learning Systems**
- Google Lit Trips (www.googlelitrrips.org)
- Knowing Edgar Allan Poe (http://knowingpoe.thinkport.org)
- Sense and Dollars: Think You Know About Money? (http://senseanddollars.thinkport.org)
- Pathways to Freedom: Maryland and the Underground Railroad (http://pathways.thinkport.org/flash_home.cfm)
to an informational system for readers. In these environments, content is not only represented within multimodal and interactive features that students can respond to and control, but it is also embedded in an instructional interface designed to connect the activities in virtual simulations (for example, a virtual museum or virtual experiment). This environment often opens up in a separate Flash-animated interface that includes suggestions for how to use the website in an education setting and how to align student activities with specific state or national learning standards.

Teachers can use online resources in ways that engage students and deepen understanding.

For example, the National Library of Virtual Manipulatives (http://nvlvm.usu.edu/en/nav/vlibrary.html) is a digital library that contains Java applets for more than 120 activities that are aligned to areas of K–12 mathematics and are translated into four languages (English, Spanish, French, and Chinese). Each tool includes a set of instructions, links to national mathematics standards, suggested learning prompts that frame its use in a real-life application, and a parent/teacher component that explains how using the tool enhances learning and understanding.

To illustrate, let’s look at Algebra Tiles, a virtual manipulative for students in grades 6–8. The digital tool appears in the center of the window; learners select an item from the top menu (Activities, Parent/Teacher, Standards, or Instructions) to reveal the corresponding text in the right frame. For example, one activity asks users to “fill in the horizontal and vertical axes to show that $4x + 2y = 2(2x + y)$.” Students and teachers can virtually explore the properties and functions of different algebraic concepts, seek support when needed, and view learning purposes.

Google Lit Trips (www.googlelittrips.org) is a collection of virtual literary trips embedded in Google Earth, a geographic information program. When readers download a Lit Trip from the lesson database, they can follow the plot and characters of a given book through those areas of the globe that serve as the book’s setting. For example, younger students who are reading Robert McCloskey’s *Make Way for Ducklings* can take a virtual trip through Boston; students in grades 6–8 who are reading *Fever 1793* can virtually explore Philadelphia; and students in grades 9–12 who are reading Khaled Hosseini’s *The Kite Runner* can virtually travel the difficult terrain of Afghanistan. During their journey, students view photographs, read excerpts from the book, answer questions, make connections between the book and the real world, and explore links to supplemental information about particular locations and landmarks.

How to Use Them. When designing lessons to accompany websites in this category, it’s important to help students recognize the connection between these virtual experiences and the concepts you cover in class. For example, after a lesson in which students use the Algebra Tiles virtual manipulative to multiply specific binomials, reserve time to help students appreciate the value of such a tool on two levels. First, the interactive nature of this tool enables students to actively construct a more concrete representation of how to group multiple unknown variables and model their use in problem situations, as opposed to just performing the calculations on a given example in a math book. Second, the open-ended nature of the tool enables students to change the value of $x$ and $y$ and instantly view how these changes influence the various parts of the equation. Reflecting with students about how these tools can enhance their understanding of challenging concepts in your curriculum may encourage them to seek out other web-based instructional systems.

Working Meaningfully Online

Although the task of integrating online information sources with curricular goals may seem daunting, teachers can refine their time-tested strategies for integrating offline resources to use online resources in ways that engage students and deepen their understanding. By concentrating on key learning goals and performance-based skills, teachers can design tasks and supports that make students’ online work meaningful and worthwhile.

References


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