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Theme: Science and Media Literacy

Media Literacy in the Science Classroom

The ongoing revolution in communications technologies has enabled university and government public information departments to offer engaging content and sophisticated communications tools to online users. We have all benefited from these advances, and all this is to the good, right? Well. . . maybe not for the future of science journalism. In November 2008, the Columbia Journalism Review published an article which argues that the quality of science journalism has significantly declined. The author asserts that the decline is being caused by a convergence of recent developments. Full-time science writers are being purged from the staff of newspapers still in existence, while press releases about scientific studies are being fashioned into high art, as government, university and corporate press officers “practically compete with journalists by turning out tempting releases that are a shade away from the finished product” (www.cjr.org/the_observatory/science_reporting_by_press_rel.php). The article continues by citing several instances in which science reporters have quoted from press releases without attribution.

Members of the general public rely on science news to make a variety of decisions as voters and consumers. If increasing numbers of science journalists are relying on content from public relations outlets, it's more important than ever for readers to know how to examine the values embedded in science news.

If you're a science teacher interested in issues of media literacy, or are looking for ways to improve instruction through more effective use of media and communications technologies, this newsletter offers many ideas for you to try in your teaching practice. You'll find a review of *Developing Scientific Literacy: Using News Media in the Classroom*, by Ruth Jarman and Billy McClune, which illuminates goals and approaches for using news media as a literacy tool in the science classroom. Another article highlights a model program which uses media and communications tools to foster science inquiry.

This issue also features an annotated collection of web and print resources to help you improve curriculum planning. While the countries of the British Commonwealth (such as Australia, Canada, and Ireland) have been integrating media literacy lessons into science instruction for some time, practitioners in the United States have only just started to embrace this approach. We hope the resources presented here will encourage science teachers throughout the country to further explore the connections between science and media literacy.

Research Highlights

The Journey North: Turning Students into International Field Scientists

Of all the elementary science education resources available online, one of the best is Journey North (<http://www.learner.org/jnorth>). Funded by Annenberg Media, the educational arm of the Annenberg Foundation, Journey North is more than a curriculum or program. It's an ongoing science project conducted by students, teachers and scientists. Registered users of Journey North track the seasonal migrations of a variety of species, from Monarch butterflies to gray whales, across the North American continent. K-8 students and teachers collect observation data and submit them online, where they are added to an international pool of data and graphically displayed on a variety of tracking maps. Naturalists and groups on field trips upload journals, photos, and data to the site from remote outposts, and teachers and students in the US use the same Web 2.0 tools to communicate with their peers in Mexico and Canada.

The Journey North site offers a core of background lessons on understanding migration, skills for tracking migration, the astronomy of seasonal change, and the sun's role in the maintenance of all living systems. Teachers can take advantage of resources and lessons on a wide variety of species and topics to create curricular units for instruction over two days or an entire school year. Teachers who want to add lessons on cultural competence may also incorporate the "Symbolic Migration" into their curricula. Students in the US and Canada send paper Monarch butterflies with special messages to students in Mexico as the real butterflies make their journey south. When the Monarchs begin their northward migration from the mountains of Michoacan, students in Mexico return the butterflies with messages of their own. Lessons on gift-giving and cultural ambassadorship are included in this section of the Journey North site.

"Mystery Class" is perhaps the most engaging Journey North program. Students apply knowledge of geography and astronomy acquired in the study of migration to tracking down classes at ten "mystery" sites. The mystery classes record the weekly changes in photoperiod (daylength) at their location during the winter, and teams of students in other classes attempt to determine the latitude of the ten sites. When sunrise times at the vernal equinox are also reported, students in the other classes attempt to determine the longitude of the sites. Each week after the equinox, Journey North provides cultural and geographic clues as the teams continue to compete in an educated guessing game about the locations of the mystery sites.

All curricula made available on the Journey North include an outline of relevant national Science Education Standards, and Journey North sponsors professional development presentations across the United States. While Journey North curricula do not directly address standards for media literacy, they frequently involve students in the process of collecting, sorting and evaluating information--key components of information literacy. Furthermore, Journey North prepares students for entry into the 21st century workforce through its project-based approach, and the fact that the data collected by students can play a vital role in the

conservation of the species which they are tracking also provides an authentic context for communication between students, teachers and scientists.

New Book Helps Students Learn Media and Science Literacy Skills

In *Developing Scientific Literacy: Using News Media in the Classroom* (2007, McGraw Hill Professional), authors Ruth Jarman and Billy McClune write, “For the vast majority of adults, the media constitute their main source of information about science and, significantly, about science-related matters that are impacting society.” This is a disturbing thought, given that many adults do not know how to critically evaluate media, let alone the results of scientific studies. Jarman and McClune’s book is written to help secondary school educators create and implement curricula intended to improve the ability of students to perform both of these important tasks.

The first half of the book is devoted to a discussion of the production and reception of science news, and a survey of research on classroom teaching and student learning. Chapters offering a framework for instruction and sample lessons and activities follow. In their concluding chapter, the authors discuss the results of the “Newsroom Project,” a collaborative, interdisciplinary special program which they helped to organize in nine schools in Northern Ireland.

As the authors point out, science articles which report breaking news can be a great antidote to fact-focused secondary school science curricula. The social context in which new studies are conducted become more relevant, and the science in these science-in-the-making articles typically is tentative, contested, supported by a weak evidence base, and dependent on collaborative processes. Such stories can support the teaching of the methods by which claims to scientific knowledge are rejected or confirmed. The book includes an entertaining, well-conceived sample lesson on reports of two separate studies which suggest that chewing gum increases concentration and memory. At the heart of the lesson are questions which ask students to compare aspects of each article, such as results and type of study conducted, as well as funding sources and the researchers who conducted the investigations.

Jarman and McClune’s analyses of science news writing, as well as lessons published in later chapters, deal with media issues directly addressed in the CML Framework. As the authors note, science news reporting may be written to highlight differences of opinion, or to entertain, but it is rarely written with the purpose of educating readers. News values such as human interest, prominence, and emotional impact dominate science news reporting. Scientists and the organizations which support them will be concerned about the way research is reported, but the values and points of view of individual news outlets will also shape the content that is finally published.

One interesting media lesson is titled “Every word counts.” The teacher reads an account of a scientific study to students then distributes sets of cards, each with specific information relating

to the study and a word count. Working in groups, students must use the cards to write a news story within a certain word limit. Afterwards, the teacher discusses which cards--and consequently which information--students left out of their reports.

The book is published and distributed by McGraw-Hill Professional, and is currently priced at \$55.95. It can be ordered from:

The McGraw-Hill Companies,

Order Services, P.O. Box 182604, Columbus, OH 43272-3031, USA

Tel: +1 877 833 5524

Fax: +1 614 759 3749

Email: pbg.ecommerce_custserv@mcgraw-hill.com

Partnership for 21st Century Skills Publishes Skills Map for Science

In June, the Partnership for 21st Century Skills, in cooperation with the National Science Teachers Association, published a “map” which integrates 21st century skills into the K-12 science curriculum. “21st century skills” refers to skills which an increasing number of employers, school officials and educational organizations (e.g., Achieve, Inc. and the Council of Chief State School Officers) believe are necessary for full participation in the 21st century workplace. The skills maps published by the Partnership divides the skills into three groups: Learning and Innovation Skills; Information, Media and Technology Literacy; and Life and Career Skills. The maps are not intended to function as full instructional frameworks, but according to Partnership President Ken Kay, they are intended to function as “awareness tools” that help teachers weave 21st century skills into their classroom instruction.

The introduction to this map outlines the nature of the intersections between science instruction and instruction for 21st century skills--some obvious, and others unexpected: “21st century skills offer some new ways of framing what have long been valued approaches in the science classroom and some new ideas for enriching students’ investigations with cross-disciplinary modes of learning.” A sample activity in the “Communication” section provides a good case in point. Students in an algebra class measure the initial circumferences of several balloons filled with helium and several filled by air exhaled from their lungs, then make additional measurements at regular intervals, and plot the changes in size versus time. This activity is relatively common in math and science classrooms, but in this case students are not relying on the classroom teacher as the primary source of knowledge. Students first communicate their findings with each other, and work together to identify equations that could possibly describe the results of their time/change investigation.

In the section for “Productivity & Accountability,” on the other hand, interesting tensions arise among skill sets and disciplines. For the enterprise of science, “productivity and accountability” translates into the high ethical standards that scientists must maintain for recording the results of their investigations and for publishing and sharing those results. A sample activity for this

skill takes questions of ethics into the realm of public policy. Students engage in a role-playing scenario based on real science and geography that models a city's decision to rebuild or relocate homes that have been destroyed in a natural disaster. The class must not only develop criteria for scientific use of data and analysis processes, but also consider the impact of their protocol on project stakeholders.

Media literacy skills appear in more than one section of this map. All of the relevant activities highlight the importance of identifying and evaluating sources of information (in all forms of media) on scientific topics. In one activity students critique the validity of a self-administered health survey accessed on a fitness magazine website. Students gather research to assess the accuracy of recommendations made by the tool, and apply their research further by designing a survey of their own.

This science skills map is featured on the July 1st edition of the [Education Week](http://blogs.edweek.org/edweek/curriculum/2009/06/science_geography_21st_century.html) blog "Curriculum Matters." Teachers and lay audiences alike can post their comments at: http://blogs.edweek.org/edweek/curriculum/2009/06/science_geography_21st_century.html



Medios Claros
alfabetización global

New Media Literacy Group Forms in Peru

Medios Claros, a newly formed educational non-profit organization in Peru, has started using the CML Framework to establish a media literacy program in Lima schools. The group was founded by three media and marketing professionals who were concerned about the lack of any formal education in Peru to help consumers understand the influence of media on their lives.

Sara Tam, Jennifer Aparicio and Daniel Chappell had been communications students at the University of Peru, and all three had been interested in issues of media education. Thirty years later, Aparicio and Tam were re-united through their children, who attended the same Lima schools, and reunited with Chappell through a chance encounter at a supermarket. Their desire to improve Peruvian culture through education about media messages remained as strong as it had ever been, and they began to conduct a wide array of Google searches to help them brainstorm ideas and make tentative plans.

The CML website surfaced when they entered the term “media literacy,” and they were excited to find a Spanish-language version of “Literacy for the 21st Century,” CML’s current overview of media literacy education.

After some intensive sifting through the Center website, the group decided to form their own non-profit organization (in Spanish, a “civil association”) and called it Medios Claros (“clear media”).

In January 2009 they made a presentation to principals at four target schools in Lima, and were surprised to learn that administrator’s at all four schools were interested in taking part in an initial training to be delivered in March by CML President Tessa Jolls.



Medios Claros has been refining its mission and goals since the March training. To date these are:

Mission: We are a civil association which desires to promote through education the ability to use, create and understand media and communication.

Objectives:

- Understand our relationship with media
- Challenge our way of thinking about the media
- Understand the importance of media literacy for our families
- Provide our children with tools to manage their relationship with media

When asked about their accomplishments, Chappell responded that, in point of fact, Medios Claros has been the first organization to implement media literacy programs in Peru. Since the initial trainings, the group has continued its pilot programs, and gained the support of teachers and parents at each of the schools.

Current projects include securing corporate "social responsibility" funding, as well as foundation funding. Medios Claros hopes to use the funding for training individual teachers to act as trainers for other teachers at their school sites.

Medios Claros founders envision the organization as a think tank taking a leadership role to ensure that the development of media literacy in Peru will not be chaotic. Says Aparicio, "We think effort shouldn't be duplicated." Medios Claros members also envision the organization as a forum for discussion and debate. Aparicio remarks, "One man's ceiling is another man's floor. We want to use the discussion about media literacy that is already taking place in Britain and the US to build the foundation for a new conversation about media literacy in Peru."

CONSORTIUM
for **MEDIA LITERACY**

Uniting for Development

About Us...

The Consortium for Media Literacy addresses the role of global media through the advocacy, research and design of media literacy education for youth, educators and parents.

The Consortium focuses on K-12 grade youth and their parents and communities. The research efforts include nutrition and health education, body image/sexuality, safety and responsibility in media by consumers and creators of products.

The Consortium is building a body of research, interventions and communication that demonstrate scientifically that media literacy is an effective intervention strategy in addressing critical issues for youth.

www.consortiumformedia literacy.org

Media Literacy Resources

Teaching Tip: Encourage an attitude of inquiry and exploration of media and popular culture rather than disparagement or dismissal. Remember, everyone tries to “make meaning” out of his/her media experiences. Acknowledge that many points of view and interpretations are possible and no single view is always “right” or “wrong.”

Science and Media Literacy Resources

Need ideas on how to introduce media literacy instruction into your science classroom? These sources can help:

Health News Review (<http://www.healthnewsreview.org>) offers daily reviews of health stories from news outlets across the US, and maintains a revolving catalogue of exemplary “five star” stories. This site may inspire you to write reviews on your own, and to plan lessons which ask students to do the same. The review is funded by the Foundation for Medical Decision Making, (informedmedicaldecisions.org) and published by Gary Schwitzer, a professor in the University of Minnesota Health Journalism Program.

Colón, Wilma V., “Cell-Phone Use and Cancer: A Case Study Exploring the Scientific Method.” *Journal of College Science Teaching*, v. 37, n. 1 (Sept./Oct. 2007), pps. 20-24. The author received a grant from the National Science Foundation to develop this case study used in a freshmen college biology course for non-majors, and it has a number of outstanding features. This case study is also available at the website of the National Center for Case Study Teaching in Science (www.sciencecases.org/cell_phone/cell_phone_notes.asp)

Thier, Marlene. “Media and Science: Developing Skepticism and Critical Thinking.” *Science Scope* (magazine published by National Science Teachers Association), v. 32 n. 3 (November 2008), pps. 20-23. Brief introduction to planning media literacy activities in the science classroom. Suggests methods for investigating health claims in advertisements.

Additional Online Sources for Science Inquiry

National Park Service (www.nps.gov)

NASA (www.nasa.gov).

National Geographic (www.nationalgeographic.com)

National Oceanographic and Atmospheric Administration and US Geological Survey (www.noaa.gov, www.usgs.gov)

Siemens We Can Change the World Challenge (www.wecanchange.com)

The Jason Project (www.jason.org)

Med!aLit Moments

The “Franken-Foods” Debate

Since the late 1990’s, heated debate has swirled around the introduction of genetically engineered strains of staple food crops such as rice, corn and soybeans. Proponents argue that these strains are resistant to cold and drought, can reduce pesticide use, and that some strains, like “golden” rice, can stave off malnutrition among human populations largely dependent on a single crop. Critics argue that the safety of these foods for human consumption has not been completely established, and that unintended interbreeding with adjacent indigenous crops could threaten the biodiversity of our food supply. While genetically engineered foods are now an industry standard, controversy has continued apace. In 1997 and 2003, the European Union passed legislation requiring labeling of genetically modified (or GM) foods, and calls for labeling to continue in the United States.

Many anti-GM foods activists dubbed them “Frankenfoods,” and some newspapers, such as Britain’s *Daily Mail*, conducted entire campaigns against them. The editorial cartoon is from the pages of the *Daily Mail*. In this MediaLit Moment, your students will discover the power of visual humor to deliver a political message.

Ask students to identify the point of view represented by a political cartoon

AHA!: This cartoon isn’t just funny, it’s asking me to take sides in a political argument!

Key Question #4: What values, lifestyles and points of view are represented in or omitted from this message?

Core Concept #4: Media have embedded values and points of view

Grade Level: 10+

Materials: Political cartoon shown on next page



'Tell the manager the truth have you been nibbling any of his genetically modified food before mummy has paid for it?'

Note: Questions for Discussion and Further Questions for Discussion are partially adapted from material in *Developing Scientific Literacy: Using News Media in the Classroom*, reviewed elsewhere in this issue.

Questions for Discussion: What issue is this cartoon about?

Do you think the cartoon is in favor of GM food or against GM food?

Why do you think this?

Is the cartoon fact or opinion?

What opinion or viewpoint is the cartoon communicating?

Further Questions for Discussion:

Key Question #5: Why is this message being sent?

Core Concept #5: Most media messages are organized to gain profit and/or power

Tell students that this cartoon was part of a newspaper campaign against GM foods, then ask students: why would a news source create a campaign for or against an issue?

Do you think it's possible for an editorial cartoon to show readers different sides of an argument?

Extended Activity for Science Teachers (from Exemplar in *Scientific Literacy*, pps. 130-134)

Students are reminded that in both the article and editorial cartoon, the newspaper provided us with information that supported only or predominantly one side of the argument in the GM debate. However, if we are to make up our own minds we need to seek out and consider all sides of the argument. How might we find out the arguments *both* in favor of and against growing GM crops and selling GM food?

Working in groups, students explore one or two information sources relating to GM food (interesting examples may be drawn from scientific societies, environmental groups, the BBC, etc.) and compile a list of advantages and disadvantages of growing GM crops for food or other purposes. As a class, they collate the results of their research.

Finally, in whole-class discussion, students evaluate the advantages and disadvantages of the diverse resources they consulted as sources of information.

The Five Core Concepts and Five Key Questions of media literacy were developed as part of the Center for Media Literacy's MediaLit Kit™ and Questions/TIPS (Q/TIPS)™ framework. Used with permission, © 2002-2008, Center for Media Literacy, <http://www.medialit.com>