



Classroom Energy Lagging? “Hot” Topics Turn Up the Heat

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One the goals of introductory science classes to is to instill the ability for students to use the science they learn to understand and appreciate current scientific applications.

College faculty who teach introductory science classes are well aware of the everyday applications related to their disciplines.

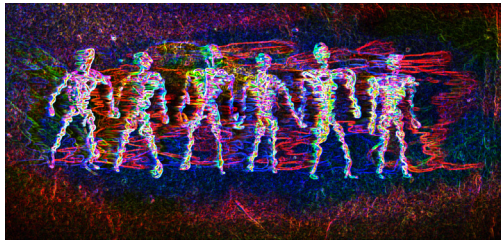
Unfortunately, this knowledge is not obvious to students.

Research shows that few students have the intuitive ability to explain everyday events using science they learned in introductory classes. Yet, the best learning occurs when students are able to apply and evaluate information in “real world” applications.

Simply introducing students to an interesting science factoid, as is done in many textbooks, does not ensure that students will fully understand the link between the factoid and what they learned in class.

Many students do not adequately learn from the factoid because they may not understand the link to the topic taught. Even if the link is shown they may compensate for a lack of understanding by merely memorizing the connection presented by the faculty.

Students of all ages need to experience the information by the instructor guiding the students



through relevant higher order thinking activities. Relevant means putting the information in a context that familiar to the students.

A simple way to remedy this possible impediment to student education is by having students analyze factoid hot topics in the various science fields.

Sources

Hot topics are contemporary newsworthy stories that have everyday applications or capture the public's curiosity. Newspapers are a very good source of "hot topics". Most newspapers in large cities regularly report science articles in a special section at least once a week. National papers such as *USA Today* routinely have science and technology sections. Tabloid newspapers are a humorous source of "science" tidbits that can be analyzed as credible or not.

Science News and *Scientific American* give equal coverage to contemporary science issues that impact everyday life. Profession and technical trade journals have columns that highlight interesting newsworthy applications of the discipline. *Nature* and *Science* are excellent sources of detailed information that span all areas of science. Other sources of hot topics are professional organization and special-interest group websites.

Teaching strategy

Simply presenting and explaining an interesting science tidbit does not improve student learning or retention of the information. The following format improves learning with hot topics:

- Teach the foundation content appropriate for the hot topic.
- Briefly introduce the hot topic showing the students a copy of the article. It's best to project an image of the article.
- Ask the students to individually list the scientific principles and terms related to hot topic.

- Have the students break up into groups to answer the following questions:
 - » 1. Explain the mechanisms of the concept covered in the class.
 - » 2. How do these mechanisms contribute to explaining the hot topic?
- Use the mechanisms to create other possible explanations for everyday scientific observations or technologies
- Use a brief question-and-answer session to review the student answers.

The following examples are great Hot Topics.

- “Today we are going to discuss global climate change...”
- “I read today in the news that glaciers in Alaska, Canada, Montana, and Peru are melting faster than ever recorded in history...”
- “I would like you to list any principles or terms we learned today in class that would help explain why the glaciers are disappearing at this alarming rate.”
- “I would like you to pair up into teams of two to answer the following questions about the news story describing the glaciers.”
 - » 1. Explain how global climate change occurs.
 - » 2. How can global climate changes contribute to the disappearance of the glaciers?
- Explain other ways global climate change can affect cold regions of the Earth.
- “Let’s review some of your answers and see how they match with what the scientists explained about the glaciers.”

Suggested Hot Topics

Biology

- Biodiversity.
- Biopharming.
- Genetically modified food organisms.
- Human genome.
- Stem cell applications.

Chemistry

- Alternative energies.
- Biochip chemistry.
- Chemistry of recycling.
- Chiral pharmacology.
- Natural versus synthetic chemicals.

Earth & Atmospheric Science

- Age of the universe.
- Earth quakes.
- Exobiology.
- Life on Mars.
- Global pollution concerns.

Environmental Sciences

- Air quality.
- Endocrine disrupters.
- Glacial retreating.
- Global climate change.
- Water quality.

Human Sciences

- Alternative medicine.
- Atkin's diet.
- Child obesity.
- Gene therapy.
- Sport enhancers.

Physics

- "Frictionless" machines.
- Hydrogen fuel and superconductors.
- Nanotechnology advances.
- Sports and athletic performance physics.