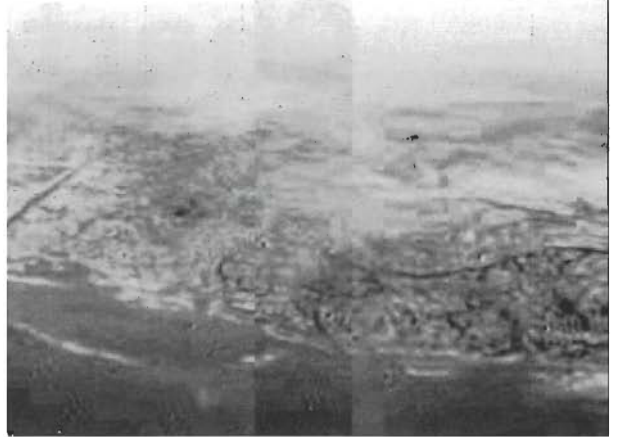


Beyond exhortation: how can we empower students to engage critically with



The surface of Titan seen from the Huygens spacecraft just before impact.

Ruth Jarman and
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'Science in the News'?

'It rained yesterday on Titan. It could rain again tomorrow. But instead of water, it rained liquid methane.'

So starts the news story written by Tim Radford, science editor of *The Guardian*, on 22nd January 2005. It continues: *'The torrents fell on a high ridge of frozen methane and flowed in a system of tributaries down to a river delta and into a dark inland sea of hydrocarbons'*. The prose is compelling – certainly more so than that of the typical GCSE textbook! Small wonder, then, that many teachers use newspapers in their science classrooms.

'Science in the News' has much to offer. Almost by definition it is up-to-date, dealing with current developments in the subject and contemporary issues in society. To be deemed newsworthy in the first instance, it is likely to score high on 'human interest' and relevance. News may also have a strong 'local' flavour that can lend it a special significance. Furthermore, science-related reports are written for lay audiences. They have to attract and hold the attention of their viewers or readers. As a consequence, they are often scripted and illustrated in an arresting and accessible style. With reason, the House of Lords' Select Committee on Science and Technology, in its millennium report *Science and Society*, concluded that: *'... science journalism is currently flourishing in the United Kingdom'*.

News items in both broadcast and

print media can be used to illustrate a wide range of ideas associated with science – its content, its modes of enquiry, and, particularly, its impact on society. All this contributes to their worth as a resource for teaching and learning.

The story, however, does not end here. Increasingly, science teachers are being exhorted to develop, among their students, an aptitude and ability to engage *critically* with science in the media. Thus, the influential report *Beyond 2000, Science Education for the Future* (Millar and Osborne, 1998), from which flowed, for example, the 21st Century Science project, proposes that the curriculum should: *'help young people be able to understand, and respond critically to, media reports of issues with a science component'*.

The arguments are telling. Many of the pressing and perplexing issues confronting contemporary society have a scientific dimension. Most people gain most of their scientific information from the media. Furthermore, though we need much more research into media effects on individual decision-making in relation to socio-scientific, including health issues, it does seem that in this arena (more so than, say, in the political arena) our actions may be influenced by what we see and hear. Newspapers in particular seek to sway their readers; they offer advice, they call to action, they wage campaigns.

So a case can be made for

promoting, among young people, criticality in respect of science in the media. However, we would contend that implementing this idea falls fairly-and-squarely into that class of human activity best described as 'easier said than done'. During a survey of science teachers' use of newspapers that we conducted in Northern Ireland, most participants reported that, while happy to exploit the resource to raise pupils' awareness of the relevance of science in daily life, they were unsure how to develop their pupils' ability to engage critically with the news stories they were studying. They pointed, too, to an absence of advice as to how they might proceed.

This cannot be denied. For all the exhortation that science teachers should help young people be able to evaluate media reports of science-related issues, there is surprisingly little guidance available to them as to how this might be done.

Work of the 'News in Science Education' group

The 'News in Science Education' group at the Graduate School of Education, Queen's University, aims to support teachers, of whatever subject, as they encourage their students to engage with science in the media and empower them to do so with a degree of criticality.

Our research has suggested that developments in this direction in science would call for:

- the identification of appropriate

and achievable teaching aims;
the identification of appropriate teaching approaches; and
the production of guidance material and ready-to-use resources.

In addition, we believe it is also important to acknowledge work done in other curricular areas. While we as science teachers may lack experience and expertise in tackling these issues with our students, teachers of English and media studies are practiced at so doing.

To address these matters, we have undertaken a number of research and development projects. Current initiatives include the Newsroom Project and Making Science: Making News.

The Newsroom Project

The Newsroom Project, funded by the Wellcome Trust, is a four-phase research and development project. In the first phase, interviews were conducted with over 30 'science in the media' experts – science journalists, science communication scholars, science educators and media educators. Each was asked the key question:

What knowledge, skills and habits of mind do you consider would be useful to individuals as they engage with science-related articles in newspapers?

This process generated a very long list of suggestions, representing potential teaching aims.

In Phase 2, we were joined by a teacher of science and a teacher of English from each of nine post-primary schools in Northern Ireland. Working together, they scrutinised the suggestions offered by the 'science in the media' experts to decide which they thought may be achievable with students of secondary school age.

Close inspection showed that this revised set of teaching aims could, fairly readily and reasonably, be regrouped under four headings. Our model, then, of what we call 'Access Capability' in relation to 'Science in the News' is essentially that of a pyramid with its four faces representing, in turn, science knowledge, media awareness, general literacy skills and discerning habits of mind. We believe that each of these domains is important, not least media awareness. We are impressed by the argument put forward by Steve Miller and Jane Gregory in their book *Science in Public* (2000):

'... understanding science-in-the-media has something to do with understanding ... science, but mostly it is about understanding media'.

Thus 'media awareness' as it relates to science reporting in the news is a major focus of the project.

In Phase 3, the science and English teachers worked together in their own schools to devise and trial activities and approaches through which the identified aims could be achieved. As an example, the activity 'Every Word Counts' aims to raise young people's awareness that, for newspapers and news broadcasts, space and time are at a premium. A scientific study is described to the students. They are then given out a series of cards, each with a statement about some aspect of the study, the scientists who conducted it or how they made public their findings. On each card is also the number of words contained in that statement. The students, working in small groups, are challenged to 'compose' a newspaper article of not more than, say, 250 words using the cards. They are reminded that the story must catch and keep the attention of a lay audience. In plenary session, the teacher discusses with them the cards – and consequently the information – they jettisoned. It quickly becomes clear that scientific detail, sources of funding, previous work, the views of other scientists and, importantly, qualifying and conditional statements are often those omitted. The young people learn that what is not written may be as important as what is written.

In Phase 4, we aim to prepare a teachers' booklet to share our ideas and experiences (both positive and negative) more widely.

Making Science: Making News

A potent way for students to learn about media texts is for them to produce media texts. This is the thinking behind our second project.

Making Science: Making News, funded by PPARC, is a cross-curricular initiative designed initially for students at the key stage 3/key stage 4 boundary. The project seeks to promote an interest in science and how it is presented in the media. Its aim is to encourage schools to establish partnerships with local newspapers, with the intention that their pupils research and write astronomy-related articles for publication.

In each participating school, a teacher from the science department and one from the English department will work together with a class that is taught by both. Based on press releases and information gathered through, for example, interviews, the students will select what they consider a newsworthy topic or event. This will form the subject of their news story or feature article. The students then face the challenge of working together as a news team to find out more about the topic and to present it, through text and graphic, in an attractive and interesting way.

A scientist will visit the school and discuss with students the topic they have chosen. A journalist from the local newspaper will work with the class, giving guidance as to how to proceed with the research, writing, headline composition and graphic design. The young people will learn about reliable sources of information, how images can be constructed to convey messages accurately and attractively, how to write science clearly and compellingly for lay audiences and how to compose headlines that draw readers into the story. Through this process they will develop not only their knowledge of science but also their skills of communication, research and teamwork. In addition, they will learn much about how science is presented in the media.

And finally...

We know that exploring 'Science in the News' can enliven and enrich our teaching. We also believe that, by equipping young people, even in a small way, to engage critically with science in the news, we are preparing them better for their future – for living and learning in a media-saturated society.

References

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