

science teacher

2010

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should students learn to 'read' science writing from the media?

Recently Miles Barker asked what might 'lifelong science learning' actually look like? This article adds to that conversation, with a specific focus on the possibility of using science in the media as a source of teaching and learning materials as Rosemary Hipkins, NZCER explains:

By studying science students will ... use scientific knowledge and skills to make informed decisions about the communication, application, and implications of science as these relate to their own lives and cultures and to the sustainability of the environment. (Ministry of Education, 2007, p28).

This overarching aim from the 'essence statement' of the New Zealand Curriculum conveys good intentions but also, I think, a certain amount of wishful thinking. As for many other nations, our most recent national curriculum framework aspires to have students use their science knowledge both now and in the years beyond school. It also aspires to the education of students who will be "confident, connected, lifelong learners" (vision statement, page 8). Most of us would happily sign up to these noble sentiments but, as Miles Barker recently asked, what might "lifelong science learning" actually look like, and what we might need to do differently at school to try and foster such outcomes? (Barker, 2010). I hope this article will add to that conversation, with a specific focus on the possibility of using science in the media as a source of teaching and learning materials.

Public attitudes to science

To begin, I want to outline some very recent research findings that take us straight to the *future* target of the above aim – i.e. interaction with science in everyday life in the years beyond school. At the start of 2010, the market research company The Nielsen Company carried out a repeat survey of public attitudes to science, funded by the Ministry of Research Science and Technology (MoRST). Now in its third iteration, this survey includes a section on adults' views of the media reporting of science issues. In the 2010 survey respondents were asked to think about an environmental issue that might concern them, and then to rate various sources of information they might (or might not) trust if they wanted to find out more. (The 2005 survey also used an issue to do with environmental pollution, whereas the 2002 research used a health-related issue of personal concern.) Finding out about an issue of concern is exactly the sort of activity we might expect adults to undertake if they really do leave school prepared to continue to engage with science issues in the manner suggested by the NZC quote above. So what did the survey find?

Figure 1 compares responses from all three research rounds: 2002, 2005 and 2010. There are several patterns in the data worth noting. First, there are no real surprises here. The sources more or less likely to be trusted are those we might predict based on our own instincts and experience. Second, there is a relative stability of responses across the first decade of this century. There will always be some sampling variation but there are few strong trends to a decline or increase in trust in any specific source of information

(the arrows show significant shifts). Given the ongoing controversy about climate change, which could be seen as the ultimate environmental issue, I had wondered if we would see some shifts to greater distrust of all sources. Third, notice the comparatively high levels of trust in television documentaries and news reporting – much higher than for newspapers (which were added to the survey in 2005) or the Internet.

If we break the data down by respondents' age groups, an interesting pattern emerges. Table 1 shows this breakdown for all the media sources, with industry scientists and lobby groups added to show that the pattern holds for other types of information sources as well. Caution is needed in reading the teenage column because the sample is only half the size of the other groups (it does only cover half the decade cohort – fifteen and up). Nevertheless, the data do show a consistent trend. As people get older they are more likely to become less trusting of all information sources. The difference between younger and older groups is statistically significant for TV documentaries and TV news and current affairs.

Again, we might say there are no surprises here. For most of us, age and accumulating experience do bring a certain level of scepticism to our interactions in the world. Nevertheless, for most people – including scientists seeking information in areas of science outside their own expertise (Jarman & McClune, 2010) – communication media are the most likely point of access to discussion about science and issues that new scientific research throws up. Should we be teaching our young people how to 'read' media sources more critically, rather than seemingly waiting for age and experience to do the job for us? Could we change the pattern shown in the table so that young people leave school as more critical consumers of science-related information in the media? (See Osborne, 2007, for an easily accessible discussion of the curriculum implications of this type of change of focus – this is an international debate, not just a New Zealand one.) If we did want to teach students to be more critical consumers of media information about science, what might we need to do differently? A recent research project that investigated this question (Jarman & McClune, 2010) throws some interesting light on potential answers. It is the focus of the rest of the article.

Building students' media awareness

The ideas outlined in this section come from a large UK project funded by the Wellcome Trust, called the *Newsroom Project*. Ruth Jarman and Billy McClune are science education researchers from Queen's University in Belfast. Newsroom began with conversations with 26 individuals with specific areas of expertise in science communication (science journalists, scientists who do a lot of media work, science educators with expertise in this area, media experts) and then built on insights from these to work with science teachers to develop approaches to making better use of the media in science lessons. From the initial conversations the researchers developed four "domains of knowledge, skills and habits of mind" which contribute to willingness and ability to engage critically with science in the news. (As an aside, this linking of knowledge, skills and attitudinal

dimensions resonates strongly with the idea of key competencies in the New Zealand Curriculum). These four areas are: science knowledge; literacy skills; enquiring habits of mind; and media awareness. All of these are worthy of further discussion, but it is the media awareness dimensions I want to focus on here.

Jarman and McClune identify media awareness as an area of expertise where science teachers have little knowledge compared to their colleagues who teach media studies (indeed they suggest teaming up with these colleagues when developing units of work that draw on media sources). They outline five areas of knowledge/awareness

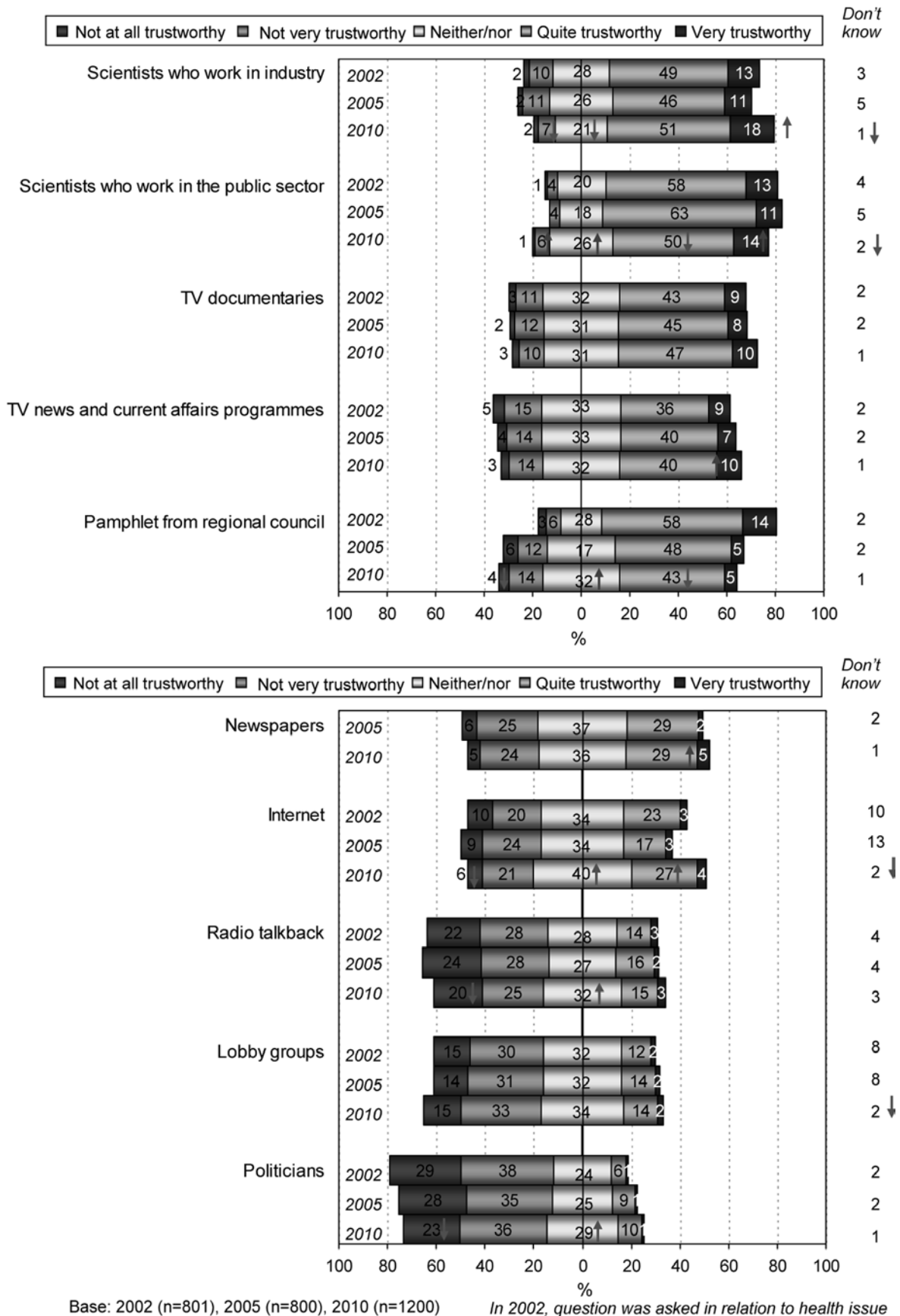


Figure 1: Comparative trustworthiness of different sources of scientific information.

Table 1: Data breakdown by age of respondents (mean response—the higher the number, the greater the likely trust in the source).

Source	Teens N = 92	20s N = 193	30s N = 243	40s N = 225	50s N = 193	Over 60s N = 251
Industry scientists	4.04	4.07	3.84	3.61	3.64	3.55
TV documentaries	3.94	3.73	3.67	3.42	3.48	3.35
TV news and current affairs	3.83	3.62	3.53	3.31	3.25	3.2
Newspapers	3.39	3.28	3.18	2.95	2.92	2.76
Internet	3.12	3.09	3.07	3.04	2.99	2.93
Lobby groups	2.79	2.66	2.63	2.58	2.45	2.33

of particular pertinence to science reporting (Jarman and McClune, 2010, p.52) which are further explained in McClune and Jarman (2010). What follows is my summary of their key ideas.

Science-related stories are prevalent in the media:

Notwithstanding doubts held by teachers and scientists, these stories can be well researched and reported, and they can bring important science issues to public notice. Even when journalists – or in some cases their publications – do have an “agenda”, it is important that students learn how to figure this out.

Science-in-the-news is a distinct genre with different features to other types of science writing: What is reported is selected and constructed for newsworthiness and usually relates to science-in-the-making rather than science ideas about which consensus already exists. Unlike scientists, who would prefer to see a full and ‘objective’ account of their work, writing news about science is selective – perceived inaccuracies are likely to be omissions, simplifications, sensationalism, or misinterpretations rather than deliberate deception.

Journalists work within constraints that shape how they write: Different types of media reports (news, editorial, features) have different conventions and presentation features (word length, style, language, narrativization, use of ‘experts’). If journalists don’t get published their work doesn’t get read so they are mindful of these constraints and conventions as they construct each story. Editors make final decisions on whether and how work will be published, and the reporter is often not the person who writes the headline for their work.

All news is value-laden: Every form of communication has inbuilt values and the news is no different. Journalists themselves, their news organisations, sources they cite, and the audiences they serve, all have particular interests and perspectives. The selection of “language, content, sources, images, presentation and placing are all potentially value laden” (Jarman & McClune, 2010, p.52).

Readers are active meaning makers too: Just as writing science news is an effortful, active process of construction, so is making meaning from this news as it has been presented. A critical, reflective response is called for, bearing in mind all the above themes. As one of the participants in the Newsroom study said:

Young people would need the ability to read critically answering questions like: Who wrote the article? What do I know about the methodology of a study being reported? Who is the source of information? Newspapers are great for developing these skills and capacities. (McClune & Jarman, 2010, p.744)

Jarman and McClune suggest that science teachers could work with media studies’ teachers – or other teachers

with relevant subject expertise – to develop their own media literacy and knowledge of teaching and learning approaches that help students develop media awareness in all the outlined dimensions. In the Newsroom research they found that cross-curriculum collaborations were a fruitful way to build teacher knowledge and confidence, and they commented that having a purpose such as this provided a more meaningful cross-curriculum framing than some of the rather contrived cross-curriculum approaches that have been tried elsewhere.

Much has been written about the trend to disengagement with science learning that occurs across the teenage years, arguably starting even in upper primary school (for a recent review in the New Zealand context see Bolstad and Hipkins, 2008). A recent UK study of students’ attitudes to science identified several features of science lessons that students said would help keep them engaged in science: being made to think; variety in activity; and seeing how science relates to life (Bennett and Hogarth, 2009). Arguably, using science stories from the news to develop media awareness would meet all three of these conditions in one activity structure! However, returning the focus to the aspiration for lifelong science learning with which this article began, Bennett and Hogarth also reported that over 70% of the nearly 300 students in their sample said they never read anything to do with science in newspapers or magazines, and between half and three-quarters of them would never watch a TV programme related to science. (They were divided into three different age groups, 11, 14 and 16 hence the range given here, with younger students more likely to watch than older ones). If we really do think continuing engagement with science in the years beyond school does matter, it is up to us to contribute to change by supporting our students to have direct experiences of the benefits and rewards of engaging critically with science in the news.

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