Creating Critical Consumers of Health and Science News: Teaching Science to the Non-Scientist Using Newsworthy Topics in the Life Sciences†

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Scientists constantly make groundbreaking discoveries, some of which receive attention from the press. We designed a course intended for a lay audience that provides the scientific background to appreciate these reports more fully. We discuss three topics in the life sciences: stem cells, cancer, and infectious disease. The course is structured to blend relevant scientific background and evaluation of primary literature with the coverage of these advances by the media and popular press. In short, lectures emphasize exposure to basic biological concepts and tools as a means of informing understanding of prominent biological questions of public interest. The overall goal of the course is not only to expose students to the media’s coverage of scientific progress, but also to hone their critical thinking skills to distinguish hope from hype.

INTRODUCTION

A sobering report from the Pew Research Center earlier this year compared public perception of science with perspectives from members of the American Association for the Advancement of Science. Some interesting data arose from the analysis. Both the public (29%) and scientists (46%) believe that K–12 science education is below average compared with other industrialized countries (11). Many scientists (75%) believe that this deficit in science, technology, engineering, and mathematics (STEM) education is a major contributor to overall limited general science background, with 84% considering this lack of knowledge to be a major problem (11).

One possible solution to a baseline deficit in science knowledge is to educate the public through the media's coverage of scientific advancements. Science content in the media frequently reflects public interest. As a result, there is interest in determining the type of scientific advancements that are considered “newsworthy” (see, for example, 4). Moreover, news is more accessible than ever due to online content (3, 9).

The hope is that the media represent science accurately; however, this is not always the case. Some online news outlets are reputable, but it is difficult for the general public to distinguish these from unreliable sources. The role of the media in reporting scientific advancements has been well critiqued (5, 8). For example, Maron (7) describes how the media can distort study findings, using a firsthand account of media misrepresentation of one of his studies. One study examining two high-profile medical journals reported a positive correlation between journal press releases and media coverage (13). A more recent report highlights a correlation between exaggerations/misrepresentations in university press releases related to research data and exaggerations/misrepresentations in news coverage (14).

Using news media as part of K–12 science education to engage students is not new (1, 6). We were particularly inspired by a National Research Council–commissioned study of informal science education initiatives (12). These reports inspired us to explore how the media could be used to convey scientific principles in a university setting. Our aim was to not only describe the science, but also instill within students the critical thinking skills necessary to become informed consumers of scientific information.

PROCEDURE

The course is designed for a lay audience, providing a scientific overview of a field while delving into some of its major publications. Additionally, we critique how the media portrays scientific advancements, taking into account any biases. We use academic press releases, major news outlets, and popular books.

The course is offered through the Harvard Extension School. An overwhelming number of students enroll with no formal science background. They range in age from high school students to retirees and work in sectors ranging from education to finance. Many have not studied biology since coursework in high school.
Stem cells, cancer, and the human immunodeficiency virus (HIV) comprise the three thematic topics for a variety of reasons. First, media coverage commonly highlights advances in these areas. Second, these topics allow for the coverage of many biological disciplines—cell biology and development biology for stem cells, molecular biology and genetics for cancer, and immunology and microbiology for HIV. Third, we informally polled students prior to developing the course and these three topics ranked toward the top of their list of scientific interests.

We begin the course with an overview of what makes science newsworthy. The course is divided into three modules, each representing one of the thematic topics (Fig. 1). Modules consist of four lectures: 1) a basic scientific background of the discipline; 2) the primary literature; 3) a popular science book on the topic; and 4) a discussion of the media representation of the primary literature. Course assignments during the term are described in Appendix 2.

Based on course feedback and evaluations, the discussion at the end of the term is highly memorable for students. Science journalists lead a discussion on the way science journalism has changed and highlight the forces influencing contemporary coverage, which include an increased emphasis on advertising revenue, a decline in readership and attention span, and competitive media outlets (e.g., social media) (10). They also describe ways in which scientists can help them in their reporting (2).

CONCLUSION

The course launched in the spring 2009 semester. Although the structure of assignments has changed little since the first offering, we have continually revised the content of assessments in an attempt to strike an appropriate balance between scientific and nonscientific content.

Student feedback for the course has been positive. One student remarked: "This is the stuff most Americans never learn, and we need to know about it in my opinion! I came out of the class with a much more subtle and sophisticated understanding of science, what advances in science/medicine really mean, and the media’s role.” Another commented: “I feel confident that I can carry on an educated discussion with anyone who does work in these fields without appearing uninformed or misinformed. I could not have claimed this ability six months ago.” In terms of day-to-day impact, a student wrote: “Just this past week, I was reading a newspaper, and my eyes automatically gravitated to science topics and I felt like I read the article with full understanding and an ability to critically engage in a social conversation about the implications.”

Instituting a strong K–12 science education is a long-term solution for generating a strong, scientifically-literate population. Concurrently, having a means to engage interest in science is fundamental for helping to educate adults. The course described above is one attempt to help accomplish this within an adult population. Further analysis of students who completed the course will aid in assessing the impact of exposure to scientific advances and help determine whether they have become greater consumers of scientific knowledge in their daily lives.

SUPPLEMENTAL MATERIALS

Appendix 1: Course reading list (primary papers, media articles, popular science books)
Appendix 2: Table of course assignments

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