

Scientific Literacy

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WHAT'S COVERED

In this lesson, we will cover the topic of scientific literacy. We will discuss how science is communicated—the various platforms, the benefits and drawbacks of the peer review process, and the process of open access journal publishing. Specifically, this lesson will cover the following:

1. What is Scientific Literacy?

Scientific literacy is the ability to understand and analyze, as well as form opinions about, scientific information and writing. This is an important skill because, in recent times, popular media is filled with scientific topics and information, such as theories, data, speculations, and opinions.

Being able to sort through this information and correctly interpret it gives you the ability to develop your own informed opinions. It gives you the ability to separate subjective or biased statements from objective ones and to understand the world around you better.

2. Scientific Communication Platforms

Science can be presented in a number of ways, with various degrees of rigor.

Scientific Communication Platforms	Description
Scientists	Scientists present their work in technical language to their peers in presentations, journals, or even posters. They sometimes also present their work to the general public in articles using nontechnical language.
Popular Media	Popular media includes magazines, television, new shows, and even documentaries. This type of media often chooses to present new, risky, controversial, and exciting science to the general public, with the goal of entertaining as well as informing. Popular media will often use a mixture of data, opinions, speculation, and personal testimony. Popular media often presents science with less rigor because it is subject to public opinion and private interests, which influence what and how information is disseminated.
	Scientific journals utilize a relatively high level of rigor through a peer review process,

Scientific journals	while popular magazines such as <i>National Geographic</i> , <i>Time</i> , <i>Scientific American</i> , <i>Popular Science</i> , and <i>Newsweek</i> do not. They present scientific information that is screened by an editor, but they do not follow a scientific peer review process.
Politicians	Politicians tend to use scientific information in a generalized manner. They are often influenced by their own agenda or opinion, as well as that of the public.



When consuming scientific information, it is important to be aware of the level of screening and review it has undergone and the biases it might be subject to.

3. Peer Review Process

Scientific information presented in a scientific journal is reviewed by a panel of experts along with a journal editor. These experts determine whether or not the information is suitable and credible for publication. The panel and editor use the following four value criteria when reviewing an article.

1. The article is first checked for scientific validity.
2. The article is checked for errors.
3. The article's methodology is evaluated.
4. The article's relative importance and impact are evaluated.

However, the following are some challenges and limitations to the peer review process.

- Bias: The journal and its reviewers may be biased about what they will publish or support.
- Inconsistency: Different journals apply different levels of rigor to the review process, which creates inconsistency.
- Time consuming: The peer review process is lengthy, which can delay publication of new science.
- Cost: To get a scientific article published can sometimes cost thousands of dollars, which may be too expensive for some scientists to afford.

Even though the peer review process adds rigor, given these limitations, it does not always lead to the publication of the best new science within a reasonable amount of time. The peer review process can delay and control what is published and therefore read as science. Because of this, it also largely determines what is accepted as science in the greater scientific community.

4. Open Access Journal Publishing

A potential solution to this is open access publishing. This process is increasingly being utilized by peer review journals because it allows anyone with internet access to get online and review the articles, which accelerates new science publishing.

This is part of a larger trend of open access to libraries and databases, which is increasing global access to scientific information.



SUMMARY

In this lesson, we talked about **what is scientific literacy**, **scientific communication platforms** where science is presented, the pros and cons of the **peer review process**, and the up-and-coming **open access journal publishing**.

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