ScienceWriters2023: Some Highlights for Editors and Others

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Conferences with online and in-person components have been taking varied forms. ScienceWriters2023, a joint meeting of the National Association of Science Writers and the Council for the Advancement of Science Writing, consisted of an online-only phase (September 26–October 3, 2023) and an in-person phase (October 6–10, Boulder, CO). The former focused almost solely on communicating science, and the latter included sessions on science. Individuals could register for the full conference or only the online portion. The current report presents highlights of some communication-related sessions from both phases.

Artificial Intelligence Tools: Promises, Prompts, and Pitfalls

By Madison Brown

The opening plenary session of ScienceWriters2023 focused on a topic of considerable current interest: the use of artificial intelligence (AI) tools in science writing and related realms. Moderated by freelance writer and editor Ellen Kuwana, the session featured a panel including journalists, an ethicist, and a technology expert.

Kuwana began by asking how current AI systems differ from previous ones. The panel indicated that current AI systems (such as ChatGPT and DALL-E) are pre-trained for a variety of tasks, do not need supervision from their creators, and can be more creative than earlier systems. It was noted that ChatGPT is programmed to predict the next word in text, based on the dataset on which it was trained and information gleaned from users.

Debra Mathews (John Hopkins bioethics researcher), Aimee Rinehart (Associated Press), Jeffrey Perkel (*Nature*), Melissa Heikkilä (*MIT Technology Review*), and Michael Madaio (research scientist, Google) spoke largely on the ethics surrounding AI, and how to determine whether something is AI-generated. Currently, Madaio said, it is mainly the user's task to catch "hallucinations" (instances in which AI generates false information and presents it as fact). The panelists urged journalists to diligently fact check any information from an AI source, and to indicate to their audience that AI was used. They also noted that copyright issues are arising because AI tools are trained on datasets containing books and other materials without the copyright holders' consent. Kuwana said the need to verify AI-generated content provided "job security for editors and fact checkers."

Another area the panel identified as being of concern was the reinforcement of racism and sexism, for example, when AI tools generate images based on their training with internet content. Heikkilä, who is part Asian, discovered that when she used an AI image generator to create pictures of herself, a large proportion were sexually explicit. In contrast, her White colleagues tended to be shown in empowering images. The panelists indicated that responsibility for fighting biases in AI lies in the companies creating the AI.

The panelists cautioned writers to avoid the "hype" of AI and be wary of humanizing this technology. Madaio recommended using the tool for what is best suited for: language-based rather than knowledge-based assistance. Rinehart said an example of suitable use was using AI to draft headlines as starting points to consider. Heikkilä said "excited but skeptical" is the best approach to AI.

How Editors Can Advance Diversity, Inclusion, Equity, Accessibility, and Justice

By Barbara Gastel

Fairness in various regards has become an increasing priority for editors in the sciences. Accordingly, at this session, a panel of editors and writers discussed ways editors can advance diversity, inclusion, equity, accessibility, and justice. Moderated by Shraddha Chakradhar (deputy news editor, diversity, *Science* magazine), the panel also included Laura Helmuth, editor-in-chief, *Scientific American;* Ellen Kuwana, freelance writer and editor; Pakinam Amer, journalist based in Cairo; and Siri Carpenter, editor-in-chief of the science journalism resource *The Open Notebook.*

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Chakradhar described the *Science* news section's policies on diversity of interviewed sources. At *Science*, stories of at least 1000 words, which usually have 4 or more sources, must avoid homogeneous sourcing (such as only male or only White sources). Also, any story about a community must include a source from it. Reporter and editor brainstorm to identify suitably varied sources. "It's really a partnership between the reporter and the editor," Chakradhar said.

Others also addressed diversity. Amer noted that source choice should be based on merit, not tokenism. She also said that when local journalists collaborate on work by outside journalists, they need to receive credit, such as through shared bylines. Kuwana encouraged considering diversity of location and career stage. Noting that various issues intersect, Carpenter touched on considerations such as using gender-affirming language, avoiding ableist language, choosing and framing topics suitably, and selecting art. She said *The Open Notebook* website has many resources on diversity and related subjects.

Helmuth discussed equity in paying freelancers. She said editors should be proactive in raising pay rates rather than waiting until writers request increases. She and Carpenter emphasized that the pay should be the same regardless of where the writer is located. "Pay as much as you can afford," Helmuth said.

Discussing podcasts, Amer said to embrace various accents rather than restricting speakers to those with standard American or British English. Ways to help speakers for whom English is difficult, she said, include sending questions in advance and being willing to re-record answers. If an accent is heavy, she noted, part of a recorded answer can be used and the rest can be paraphrased.

Other advice from the session included the following:

- Place expectations about matters such as diversity in writing, for example, in writers' guidelines and assignment letters.
- Guide photographers and artists regarding diversity.
- Remember that different locations have different time zones, holidays, and days of rest.
- Create a culture of inclusivity at your publication.

A Word Problem: The Hows and Whys of Mathematical Communication

By Francesca Landon-Harding

Many people feel alienated from the mathematical world because of its dry numbers, complex equations, and technical language. This session's panelists addressed how to navigate these issues to foster a sense of mathematical belonging in everyone.

What does it mean to communicate math? Noelle Sawyer is now a communications manager at Michigan State University, broke it down. Drawing on audience answers, Sawyer characterized communicating math as explaining and applying mathematics without unnecessary numbers and jargon. Using "kernel" as an example, she noted that words can mean different things in math than in everyday life.

Sawyer also advised writers to use analogies and images. She said it is fine to use "the black box" rather than presenting every detail. For example, she noted, you do not need to know how to assemble an engine to drive a car. If there is no way around jargon, she said, do your best to define the terms simply.

Examples are also powerful tools for effective mathematical communication. Sam Hansen, mathematics and statistics librarian at the University of Michigan, Ann Arbor, discussed splitting a cake as a running example to present mathematical approaches to dividing a resource fairly. For complex mathematical problems, Hansen suggested using just one example but solving it in different ways. Hansen suggested using multilevel examples to cater to varied levels of understanding, as has been done in *Quanta Magazine*. Hansen also recommended including images whenever possible, either making the images oneself or asking mathematicians to create simplified versions. Sawyer added that images give people the intuition and agency to engage with the material.

Relating mathematical concepts to concrete experiences is another effective strategy. Kenna Hughes-Castleberry, public information officer at the physics institution JILA and freelance writer, said she has found herself lost in the math of quantum computing. She explained that seeing how the math applies to the world around her helped her get grounded. Hughes-Castleberry advised looking at the beginnings and ends of mathematical papers to find those real-world applications. When writing, she suggested phrasing things with "inaccurate accuracy"—in other words, in a way that is easier to grasp even if it is not as exact. For example, instead of saying "the population increased by 90%," she advised saying "the population almost doubled." Hansen advised starting pieces with the application to capture interest before introducing the math.

In closing, Hansen borrowed an idea from mathematician and mathematical mime Tim Chartier of Davidson College, advising writers to leave the reader with at least one good mathematical memory. Doing so can distract readers from dredging up doubt about what they might not know.

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