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SCIENCE EDITOR



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ANNUAL MEETING REPORTS**



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On the cover: This Science Editor cover features Earth as seen by the Artemis II crew on their recent voyage around the moon. Taken on April 2, 2026, by "an Artemis II crew member aiming a camera through a window of the Orion spacecraft. The image was captured after Orion completed its translunar injection burn, the critical maneuver that sent the spacecraft on its path toward the Moon and back." The Artemis II mission was the first crewed flight to leave low Earth orbit since Apollo 17 in 1972 and marked the furthest a human has ever been from Earth. **Credit:** NASA https://www.nasa.gov/image-detail/fdo2_for-pao/



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There is No Ending: Looking Back on 8 Years of *Science Editor*

Jonathan Schultz

As my term as Editor-in-Chief of *Science Editor* comes to an end, I'm struck by how much has changed in scientific editing and publishing over the last 8 years and how much it is likely to continue changing. Maybe that has always been the case, but evolving publication models and platforms, open science, COVID, a shifting science funding landscape, and the rise of AI have made these years seem particularly tumultuous.

At *Science Editor*, along with our incomparable Managing Editor, Beverly Lindeen, and a dedicated Editorial Board, we have strived to serve as a beacon and bastion during these confusing times and have worked to publish important, impactful, and interesting articles, interviews, perspectives, and more that we hope have helped our readers stay better informed and improve their publications and workplaces. In addition, I'd like to highlight a few of our accomplishments and initiatives:

- **Consistent Publication:** My priority as a new EIC in 2018 was to return *Science Editor* to a consistent quarterly issue publication schedule with a steady supply of Early Online articles published soon after acceptance. Except for some recent website-related delays, I'm happy to report that has been maintained and I hope that readers have come to expect and appreciate the flow on new articles.
- **Improved standardization:** It is important to both authors and readers that *Science Editor* reflect industry best practices. In 2019, CSE became a member of CrossRef, and we began registering DOIs for all articles. We also started collecting and publishing ORCIDs for all authors who provide them. We have also implemented a standardized Publication Agreement for authors and

added disclaimers to all articles to protect CSE and the Editorial Board and allow us to publish a wide range of opinions.

- **Enhanced Reading Experience:** As a key CSE member benefit, it is important that both the print and online versions of *Science Editor* make for an enjoyable and engaging reading experience. Online, we have worked to tag and collect articles for greater discoverability and spotlight photos and figures whenever possible. In print, we have tried to make each issue similar to the experience of reading a well-curated magazine with a striking cover and images throughout, a mix of short, breezy quick reads and more in-depth articles, and topics ranging from lighthearted (but informative) to serious.
- **Special Focused Issues:** Starting in 2023, we began publishing annual special focused issues around significant topics including careers, transformations and transitions, what the future may hold, and the increasingly international landscape of scientific editing and publishing. These issues have been very well received and have helped expand the readership and contributors to *Science Editor*.
- **Increased Visibility:** As a quarterly publication, it was important that *Science Editor* be promoted more regularly, so in October 2018, I started the monthly *Science Editor* Newsletter. The Newsletter has been a fun way to engage with CSE members, and I've loved all the feedback I've received. In February 2021, we created a *Science Editor* Instagram account (@csescienceeditor) to post the covers from issues and other images of interest.
- **Supporting the Council of Science Editors:** *Science Editor* is an important and essential member benefit for CSE, and we have tried to support CSE fully throughout our editorship. First and foremost, we have worked to publish on a variety of topics that cover the full spectrum of potential CSE members, ensuring all members find representation and interest in our pages. In addition,

Sections of this article were adapted from my Meritorious Achievement Award speech given at the May 2026 CSE Annual Meeting.

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for the CSE Annual Meeting, we publish a meeting preview by each meeting's co-chairs and have focused on reinvigorating the Annual Meeting Reports process so that almost all sessions at the annual meetings have been covered with high-quality reports. Since 2020, I have also interviewed the incoming President of CSE, providing a platform for them to share their vision for their term as President.

For all these accomplishments, I want to emphasize how *Science Editor* is a collective achievement created by a dedicated team that includes myself, our Managing Editor, Beverly Lindeen, our editorial board, and the many contributors to *Science Editor*. In my opinion, one of the many strengths of *Science Editor* is that it is a community project, reflecting the insights, experiences, and opinions of a wide range of CSE members and beyond.

It has also, over the years, reinforced that I think it's best to approach "science editor" as a broad term encompassing multiple positions, including editors-in-chief, professional scientific editors, academic editors, handling editors, technical editors, managing editors, copy editors, manuscript editors, project editors, production editors, data editors, editorial assistants, and so on. We have published articles by, and about, all these roles and more, and it has been my great joy and honor learning from everyone and sharing that out with the world.

In learning about all these roles, my main takeaway has been that editing, in all its forms, is a human endeavor. It's about applying our judgments, insights, expertise, ethics, backgrounds, and experiences, and usually in the service of someone else's work. I strongly believe that the work of

editors is essential and transformative and will only become more important in a rapidly changing landscape of science.

To close, I think it is appropriate to highlight this passage from my 2018 introductory editorial:

In many cases, the day-to-day work of these roles may be different, but what binds them, and why I feel calling them all "science editors" is appropriate, is we all share the common goal of improving the scientific literature, enhancing the scientific record, and ultimately advancing science and our understanding of the world.

This goal is reflected in CSE's vision statement: "To be indispensable in the communication of science." Building on that vision, under my watch, the mission statement for *Science Editor* will be as follows: "To provide science editors with the knowledge, skills, and concepts they need to run the best version of their journal or publication in pursuit of improving the scientific literature."

I see CSE and *Science Editor* being the place where these different types of editors can interact and support each other. To put it succinctly, I want *Science Editor* to be the place where editors connect.

I'd like to think we were successful in that regard and we are leaving *Science Editor* in a good place so the incoming editorial team of new Editor-in-Chief, Daniella Thoren, and new Managing Editor, Ashley DiMatteo, can make it even better. My term may be over, but *Science Editor* will continue to grow and thrive, and I'm excited to see what comes next. I thank CSE for everything and for allowing me this opportunity. I am humbled and forever grateful.

Brittany Swett: Guiding CSE Through a Transformative Time

Johnathan Schultz

As the Senior Director of Peer Review and Production Services at Wiley, Brittany Swett is responsible for a large global team providing peer review, production, and consulting services to publishers and societies in the industry. She credits CSE for providing her with many opportunities, skills, and experiences that have supported her professional success, and she's looking forward to giving back to CSE as their incoming President. Just before the start of her term in May, Brittany spoke with *Science Editor* about setting goals for her presidency, responding to industry changes, and navigating disruptive technologies like artificial intelligence (AI) while maintaining integrity.

Science Editor (SE): What was your career path that led you to scientific editing and publishing?

Brittany Swett (BS): I really wanted to be in magazine publishing. My first job out of college was at a lifestyle magazine in Western North Carolina called WNC. The magazine covered personal interest stories about culture, food, events, and what makes that region of the state really special. I had an internship there, and I realized that magazine publishing in that way wasn't for me. There was a lot of writing and editing, and I did not want to be a writer. So while I thought the product was interesting, it wasn't what I wanted to do. I had this very *charming* idea of what publishing was, and then I got into magazine publishing, and realized it was not where my interests lie.

I then came upon a job ad to work at J&J Editorial, and that was where I found my niche. I consider operational excellence a personal strength. I like to guide the process. I like to collaborate. I don't want to be the writer or the subject matter expert. I prefer process management and systems thinking. Like many of us, I had no idea that scholarly publishing was a career option, and I appreciated the intersection of all skills I could develop by working on different types of journals. One of the journals that I started working with that had a big impact on me personally was the *Journal of Midwifery and Women's Health*, owned by the American College of Nurse-Midwives. ACNM's mission to achieve optimal, equitable health outcomes for people and communities through the advancement of midwifery was inspiring and got me hooked on the power and reach



Brittany Swett

of scholarly publishing and its impact at the societal level, at the public health level, but also for individuals.

Working at J&J Editorial, I started as an editorial assistant processing manuscripts and over time, as that company grew, I received more leadership opportunities to lead bigger teams, to take on more complex projects, and to work more strategically with our customers.

SE: I see that you cowrote articles for the midwifery journal.

BS: I did. I had a special relationship with the Editor-in-Chief, Dr Francie Likis, and it was our partnership that inspired me to go to graduate school and get my Masters of Public Health. My MPH had a concentration in leadership and there was significant emphasis on change management, team building, leadership, persuasion, and systems thinking that, although I didn't take those skills into a public health-specific field, I use all the time in my current role.

SE: This May you become president of CSE. What has CSE meant to you?

BS: CSE has been a very welcoming community, and I think that comes through in a lot of my conversations with colleagues. They feel that everyone in CSE is very approachable, and there is a strong sense of community

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and openness. I think back to my first interaction with the CSE Annual Meeting in 2014, where I won a scholarship to come to the meeting. It was such an honor. I remember Glenn [Landis, former CSE President,] talking with me, and I was like, oh my gosh, it's Glenn Landis and he's encouraging me to get involved in a committee. Just so accessible in that way, from day one. One of the things that I really love about scholarly publishing is that it's changing all the time. The pace of change can be overwhelming, but that change means there is always a challenge. Intellectually, I find it very stimulating, and CSE was a great community to build a broader understanding of the drivers behind change, the need to adapt, and the skills and actions required to thrive in such an environment.

CSE has helped to support my own career development through change from a leadership perspective. I've previously worked on webinars and short courses. CSE gave me probably my first professional opportunity to present on a panel at the annual meeting, and I later became a program co-chair. When I didn't have a chance in my position at work to tackle certain topics or have leadership opportunities, I got that experience from CSE. There is a beauty in how complementary my professional career advancement was with my CSE advancement. It has been symbiotic in the best sense, and a huge asset in my career development and development as a leader and a person. I'm so grateful for how CSE makes the path for contribution to the community attainable and rewarding.

SE: What are you looking forward to most as CSE president?

BS: Just like in publishing itself, CSE is in a moment of transformation. As an organization, we need to open every conversation with: Is this the right thing to be doing? How do we do it differently? Is this still serving our members? And if yes, how do we need to change it to make it sustainable? And if not, how do we pivot away from that? That can create the need for difficult, uncomfortable conversations. But I think since our management transition several years ago, we've been in a place where we're stable and getting back to fundamentals, and I think we're in a good place. Now we need to ask ourselves some of the hard questions about what's going to make us sustainable as an organization as we look to the future of what professionals in the scholarly publishing industry need to thrive. I think a lot of that is tied to who our members are, whether it's editorial, production, marketing, business managers, we need to understand how their roles are changing, and we have to adapt to meet those evolving needs.

Think about a managing editor now versus 10 years ago. I have to know about technology. I have to know about peer review infrastructure. I have to know about AI, obviously.

I have to know some components about business. I have to know what's going on with my researcher base and how their funding works. There is a lot of complexity with change at a rapid pace. So how do we make sure we're adapting our approach to serving our members in a way that matches that while we're also going through a transformation? I'm really excited about embarking on a new strategic plan, which we have not updated since pre-COVID. I think taking on some of those themes of transformation and really thinking about the future is critical for us at this juncture.

SE: That is great timing as I think we've reached a point where we truly are in a post-COVID period and need to be thinking about what comes next.

BS: Exactly. In our day jobs and in CSE, how do you maintain the foundational aspects of our roles or our mission that are core to our identity, but then how do we change in other ways at the same time? That balance of stability and innovation is going to be tricky, but exciting.

SE: That's a great way to put it. You mentioned that you started with CSE getting a scholarship to the annual meeting, and now you're becoming president. What would you say are the skills, abilities, and attributes that were most helpful in that path?

BS: I think the biggest thing is being curious, wanting to learn new things, and being open to new experiences. When thinking about the different opportunities I've had with CSE, some of them were intimidating, such as being program chair. I was very nervous about that, but I felt like I had the skills to do it and I had a lot of cheerleaders within CSE and in my organization supporting me. I wanted to be open to new experiences and challenges. I think being curious and always wanting to learn are essential to our industry because things are changing so much. There are forces around us, and we can try and shape them some, but you've got to go with the flow and try and do it with integrity. Adaptability is huge: accepting change and what we can't necessarily control. AI (artificial intelligence) is a good example of that. It is here. It is not a choice we have. So how do we adjust to it responsibly and ethically and thinking through all the implications of integrating it across many aspects of research and publishing?

I also think emotional intelligence is important. I think listening is one of the things that has helped me in my CSE career as I've participated in committees. Really listening to what other people have to say can help me and I can take that knowledge back and share it with my team, but it also helps me build connections. We are an interconnected community: if I hear something in one committee, sometimes that'll spark an idea like, "Ooh, that would be a good webinar idea." It's trying to build those connections. Listening intently is

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important, both for gaining the knowledge to help yourself, but also helping the community.

SE: I like your earlier point about using CSE as a professional training ground. I hadn't thought of it that way before, but I was giving presentations at CSE before I was giving them to large committees at my organization. My experience with CSE made me more comfortable and confident.

BS: I think one of the great things about CSE is that it creates spaces where early career and mid-career professionals have the opportunity to interact with more senior professionals, which helps build confidence. It demystifies the hierarchy a little bit, which is important in your career because we all have imposter syndrome at some point. That sense of community within CSE really helps with that.

SE: You've already talked about magazine editing, but if you weren't in scientific publishing, what would you be doing instead?

BS: If I had been a really brave person, when I went back and got my master's in public health, I would have actually become a midwife, but that would've entailed nursing school and midwifery training. I think that or something in the public health sphere.

SE: Let's wrap up by telling me how you are thinking about the future?

BS: I spend a lot of time thinking about how technology is reshaping publishing. Right now, the conversation is centered on AI, but in many ways this is the next phase of a longer evolution that started with the shift to digital. We're at another real inflection point. What feels especially important in this moment is keeping humans at the center. Technology is a powerful enabler: it can accelerate workflows, surface insights, and expand access, but it's people who build trust, form relationships, and make the kinds of nuanced connections that truly move ideas forward. Those are things models can support, but not replicate. At its core, publishing, and really CSE's mission, is about communication. It's about taking an idea that's developed in one place, sharing it, and enabling others to build on it in meaningful ways. Technology absolutely helps us do that, but the origin and impact of that process are still deeply human. So for me, the question isn't whether we embrace AI: we will and we should. The question is how we use it intentionally to amplify what humans do best: think critically, collaborate, and apply judgment with integrity. If we can get that balance right, this isn't just a moment of disruption, it's a real opportunity to strengthen the value and impact of what we do.

Medical Editing: Behind the Book

Barbara Gastel

"Of all the ways to begin a book on medical editing, a poem would not be my first (or second or third) guess," a review¹ of my recent book, *Medical Editing: A Guide to Learning the Craft and Building Your Career*,² begins. Fortunately, the reviewer concludes that the lighter touches enhance the book, which is mainly for prospective and beginning medical editors but also can serve others. Both in content (see Box) and approach, the book draws on my learning over the years as editor, writer, and teacher of writing and editing. The following is the tale behind the book, with emphasis on my experience as an "editor as editee."

The Path to the Book

People often ask how long it took me to write the book. Depending on the perspective, the answer could be about 50 years, about 25 years, about 10 years, or intermittently over a few years.

My involvement in editing began with editorship of my middle school newspaper, and my interests in medicine and writing originated even earlier. All 3 interests remained active during high school and college. As college graduation approached, I struggled to decide between seeking an editorial career and a medical one. Back then, a clear path existed only to the latter. So, I took the easy way out and attended medical school.

Early in my medical studies, a fellow medical student mentioned that the *Johns Hopkins Medical Journal*, edited by a faculty member, was seeking student assistant editors. I applied and was accepted. The experience was pivotal, and I decided to pursue a career in medical communication. Thus, the roots of the current book date back to 1976, when I joined the staff of the (since-defunct) journal.

Barbara Gastel (<https://orcid.org/0000-0003-0804-2953>) is a professor at Texas A&M University, where she directs the graduate program in science and technology journalism. Some content in this article has appeared in online presentations for the Board of Editors in the Life Sciences and the American Medical Writers Association Greater Chicago Area Chapter.

<https://doi.org/10.36591/SE-4902-001>

Fast forward to about 25 years ago. My career path had led me to a mass media fellowship and then to employment in government and ultimately academia. At Texas A&M University, I developed a science editing course, which I have taught ever since. I also provided medical editing training in China, where I had taught for 2 years. By about 10 years ago, I surmised that my teaching materials on science editing could form the basis of a book.

Since 2017, I also have taught substantive editing in the University of Chicago Certificate Program in Medical Writing and Editing. Several years ago, the program's administrator said the University of Chicago Press was seeking book ideas. I had been envisioning my book for its series Chicago Guides to Writing, Editing, and Publishing. I expressed interest and met with acquisitions editor Mary Laur, who oversees the series. She recommended focusing on medical editing and invited me to submit a proposal.

Preparation of the book proposal followed. As is common, it consisted of a cover letter, annotated table of contents, curriculum vitae, description of expected market, and sample chapter. Peer review of the proposal followed. Then came an advance contract—and the writing of the rest of the book. The manuscript underwent peer review, which was followed by final revisions. Then came copyediting, cover design, page design, indexing, and printing. Meanwhile, I collaborated with the marketing team.

Editor as Editee

As an editor (including editor-in-chief of CSE's *Science Editor* from 2000 to 2010) and a teacher of editing, I found it instructive to be in the author's role again. Acquisitions editor Mary Laur helped with large-scale issues. As noted, she recommended focusing on medical editing rather than science editing as a whole. (Much of the book's content, though, also applies to other science editing.) She devised the book's subtitle, which was much clearer than my working one. She guided me in responding to peer review and in refining the preface to clarify the scope of the book. It was her fine idea to bring my editorially related poem, which had been buried in the middle of the manuscript, to the front of the book.

As one who advises others about responding to peer review, I found it enlightening to have my own work peer

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reviewed. For the proposal, the reviews were an author's dream: All 3 reviewers were highly positive, and their suggestions were helpful and consistent with my vision. For the full manuscript, however, my experience with reviews was mixed. Two of the 3 reviewers were highly positive and had few, if any, suggestions. Reviewer 2, though, was derogatory and seemed to want a different book. That review was nevertheless helpful. For example, based on this reviewer's recommendations, I added lists of key points to the ends of the chapters.

It takes a manuscript editor to fully appreciate one, and I appreciated mine. I had striven to submit a clean and concise manuscript, and to my relief, the manuscript editor made few changes. However, her fresh eye picked up glitches I had missed. She also had helpful queries. For example, when she asked why items in one of the lists appeared in the order they did, I realized that clarification was needed. I enjoyed working with the manuscript editor, and she said she appreciated working with a professional writer and editor.

Involvement in marketing also is part of the author experience. As with previous books, I completed a detailed questionnaire for use in marketing. Currently, authors also are expected to take a more active role. For me, doing so has included signing books at a conference, posting in social media, writing an online article for *Writer's Digest*, being interviewed for podcasts, giving online presentations for professional organizations, and donating a signed book to a professional society's silent auction. I enjoy the marketing activities, though adding them to an already busy schedule can be a challenge.

Looking Ahead

These days, fewer venues are publishing book reviews than when my previous books appeared. However, some reviews have come out—and, thankfully, they have been positive. I hope more reviews will appear. As well as helping to publicize the book, reviews often provide useful ideas for refining such books and doing related writing.

Having written *Medical Editing*, I can now draw on it as a resource in my teaching. I sometimes base presentations on material in it. I also assign parts of it in my Texas A&M course and University of Chicago course. (The libraries of both universities provide the book online, which keeps me from facing a conflict of interest.) Because the book contains exercises from my courses—plus answer keys—I have had to develop some new graded exercises. Pedagogically, the situation is an asset: Students can do the published exercises, check their answers against the keys, and then complete analogous exercises.

Involvement in marketing continues, in part through presentations related to the book. I also hope to keep using

Box. Contents: *Medical Editing: A Guide to Learning the Craft and Building Your Career*, by Barbara Gastel (University of Chicago Press, 2025)*

- Chapter 1: The Scope of Medical Editing
- Chapter 2: Key Resources for Medical Editors
- Chapter 3: Approaching an Editing Project
- Chapter 4: Copyediting: Editing for Mechanics and More
- Chapter 5: Substantive Editing: Editing for Content and Organization
- Chapter 6: Editing Conference and Career Communications
- Chapter 7: Additional Aspects of Medical Manuscript Editing
- Chapter 8: Ethics: Your Own and Others'
- Chapter 9: Careers in Medical Editing

*For a detailed table of contents, see <https://press.uchicago.edu/ucp/books/book/chicago/M/bo257227736.html>.

social media in this regard. For the latest edition of *How to Write and Publish a Scientific Paper*,³ of which I am now lead author, I provided a nearly yearlong series of weekly LinkedIn posts, each featuring highlights of a chapter. Starting in late 2026 or early 2027, I expect to provide a similar series for *Medical Editing*. Such series can simultaneously maintain visibility of a book and share core content with readers (such as those in resource-limited environments) who cannot buy or access the book.

Medical editing is a continually evolving field. New ideas arise, new resources become available, the artificial intelligence landscape keeps changing, and more. Thus, changes have occurred since I reviewed the book's final proofs. I try to keep track of such changes, both to supplement material in the book and to help be prepared if eventually a new edition seems warranted. The story is now extending for more than 50 years.

Resources and Links

1. Hutchason B. A review of "Medical Editing" by Barbara Gastel. Northwest Editors Guild. <https://www.edsguild.org/blog/a-review-of-medical-editing-by-barbara-gastel>
2. Gastel B. *Medical editing: a guide to learning the craft and building your career*. University of Chicago Press; 2025.
3. Gastel B, Day RA. *How to write and publish a scientific paper*. 9th ed. Greenwood; 2022.

Why Reading and Reviewing, Not Writing, Define Scientific Rigor in the Age of AI

Ashutosh Ghildiyal

In scholarly publishing, writing has long been assumed to be the central skill in research communication. The rise of generative artificial intelligence (AI) and large language models (LLM) shifts the center of value in scholarly publishing away from writing itself and toward perceptual skills such as reading, reviewing, observing, and generating original insight. For researchers, editors, and peer reviewers, insight develops through sustained engagement with ideas and evidence.

Wide reading and thoughtful reviewing strengthen the originality of research questions and interpretations. Researchers who read deeply across their field develop a richer sense of context, allowing them to situate their work more precisely and make contributions that are both relevant and distinctive. Reviewers who read with care identify conceptual gaps, methodological weaknesses, and overlooked implications before publication, thereby improving the quality and integrity of the scientific record.

Scientific writing, by contrast, is largely a technical and formal activity. Its purpose is not to discover, but to communicate discovery within established frameworks, conventions, and formats. Clarity, structure, logical flow, and adherence to disciplinary norms are essential, but they are not creative in the same sense as the acts of observation and insight that precede them.

This is where AI is especially powerful. When researchers provide clear intent, well-defined context, and a coherent understanding of their findings, AI tools can assist in expressing those discoveries effectively. They can help organize arguments, refine language, ensure consistency,

and align manuscripts with the formal expectations of scientific articles. What AI cannot supply is the insight itself. The irreplaceable human contribution lies in observation, judgment, and awareness, which must guide the scientific writing process even when AI is involved.

Understanding AI's Capabilities and Limitations

To understand AI's limitations and value, it helps to examine the nature of thought itself. The first type of thought originates in belief, ideas, knowledge, and memory. It is a reaction to what is already known, a borrowing from existing patterns. This is mechanical intelligence: highly capable of processing, organizing, and recombining information, but operating entirely within the boundaries of what has already been recorded.

The second type arises from the observation of fact: realization, contextual awareness, and insight into what is actually happening in the present moment. This indicates real intelligence, requiring discernment, observation, and awareness that cannot be derived from stored data alone.

AI is modelled on the thinking process, particularly thought that originates from knowledge and stored memory. It replicates verbal and visual abilities, along with predictive, logical, and reasoning capabilities within that domain, and it does so at a speed and scale far beyond normal human capacity. AI excels at representing the first type of thought: the continuation, recombination, and expansion of accumulated knowledge, and the training of that knowledge into skill. What AI cannot do, however, is access insight that arises from a total perception of a fact, or from the moment when thought itself comes to a stop after sustained engagement with a problem. In other words, AI cannot say, "I don't know," and remain in that state until insight emerges. That capacity, the ability to suspend knowledge and allow insight to arise, lies at the heart of the creative process.

This distinction explains why AI is extraordinarily useful yet not true intelligence. Its value lies in reducing mechanical cognitive effort and helping humans manage

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complexity and scale that otherwise not be possible or would take enormous human effort and time. AI can amplify, but it cannot originate, what is genuinely new. Originality arises from observation that is independent of recognition. Recognition can follow for the purposes of storing, analyzing, and communicating, and that is the role of memory and AI.

Can AI Replace Researchers as Authors?

This question can only be answered by clearly distinguishing between the mechanical and nonmechanical dimensions of scholarly work. At the core of research lies observation and discovery. It is through direct engagement with data, phenomena, and existing literature that insight arises. The expression and communication of that insight are secondary, though still essential, because they allow knowledge to be shared and advanced.

Observation, together with the insight that follows from it, constitutes the nonmechanical dimension of research and cannot be substituted by AI. AI, as we have noted, operates entirely within the domain of knowledge. Knowledge, by its nature, belongs to the past and is always incomplete, as it can continually be added to. AI can reorganize, predict, and generate text based on existing patterns, but it cannot observe. Observation is always new and grounded in the present moment. It involves awareness, contextual understanding, and judgment, all of which remain distinctly human.

In scientific writing, what ultimately matters is not who composes each sentence, but whether the original insight, interpretation, and intent of the research are faithfully expressed and rigorously validated by the researcher. This responsibility includes critical review, revision, and final approval of the manuscript prior to submission and publication. Researchers do not need to author every word or determine every phrase. Tools that assist with the mechanical aspects of writing, such as structure, clarity, consistency, and language, should be welcomed if they allow researchers to devote more attention to what cannot be automated: observing, understanding, interpreting, and generating original insight.

This raises an important question: why do we insist that a scientific article must reflect an author's "voice"? In scientific communication, clarity, rigor, and objectivity matter far more than stylistic expression. Writing, in this context, is not the primary site of thinking but a practical means of communicating thinking that has already taken place. The core intellectual work is completed during research, analysis, and interpretation. The article itself is an artifact of standardized and objective communication.

Scientists should, of course, strive to communicate clearly, as this advances science. Yet it is neither realistic nor necessary to expect every researcher to be an accomplished writer. Language barriers, limited training, time constraints,

and differing skill sets are common realities. The role of publishers should therefore be to support researchers in bridging this gap, not to penalize them for it.

From this perspective, the use of AI in scientific writing is acceptable, provided the researcher takes full responsibility for the content, interpretation, and conclusions presented. AI cannot replace the researcher as the source of insight, but it can legitimately assist in expressing that insight. The researcher's irreplaceable contribution lies in observation and interpretation. Writing is the instrument through which that contribution is communicated.

Why Concerns About AI in Scientific Writing Are Misplaced

A common counter-argument in debates about AI-assisted writing is that writing is how people process ideas, and that clear thinking requires clear writing. While this may hold true in reflective or exploratory forms of writing, scientific writing operates differently. In science, the primary work of thinking occurs during observation, experimentation, analysis, and interpretation, not during writing.

Scientific ideas are formed through engagement with data, methods, literature, and phenomena. Hypotheses are tested, results are examined, anomalies are questioned, and conclusions are drawn before the writing stage begins. By the time a scientific manuscript is drafted, the core intellectual work has already been done. Writing, in this context, is a structured method for communicating discoveries within established conventions.

This is precisely why scientific writing is especially amenable to automation. Drafting sections such as methods, results summaries, literature overviews, or standard introductions is largely mechanical. These sections follow predictable formats and prioritize precision, clarity, and reproducibility over personal expression. AI can assist effectively with organizing content, refining language, ensuring consistency, and aligning manuscripts with disciplinary norms, particularly for researchers managing heavy workloads and increasing publication demands.

What matters is not whether AI assists with writing, but whether the underlying observation, interpretation, and judgment remain authentically human. When a researcher uses AI to help draft or refine a manuscript, only the mechanical layer of communication is being supported. Responsibility for defining the research question, interpreting results, contextualizing findings, and validating conclusions remains entirely with the researcher.

The real risk lies not in using AI for scientific writing, but in relying on AI for activities that require perception and evaluation. Reading, reviewing, and assessing research demand attention, discernment, and contextual understanding. Automating writing can free time

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and cognitive energy for these nonmechanical tasks, strengthening rather than weakening scientific thinking.

Seen this way, AI-assisted writing does not undermine scientific rigor. When used appropriately, it supports efficient communication while preserving the essential human role in discovery, judgment, and understanding.

Why Human Review Remains Essential

The value of peer review does not depend on its ability to perfect language or smooth prose. These are mechanical tasks that AI can increasingly handle. The true value of review lies in a reviewer's capacity to detect nuance, challenge assumptions, identify blind spots, and evaluate whether a manuscript contains genuine originality.

Human review thrives when certain conditions are in place, including cognitive diversity, appropriate recognition, manageable workloads, and a meaningful review process. When these conditions exist, reviewers provide something no model can offer: discernment grounded in real-world experience, disciplinary understanding, and perceptual insight.

Peer reviewers also carry an untransferable responsibility. They must stand behind their judgments about the validity, originality, and significance of a study. AI cannot assume this responsibility. It can summarize or rephrase, but it cannot evaluate what matters most or bear accountability for those judgments.

Tasks requiring review and evaluation must therefore remain human responsibilities. AI may assist with summarization or initial sorting, but it should not read for meaning or contextualize arguments. Review is where interpretation, judgment, and insight are applied, and these capacities remain uniquely human.

What This Means for Scholarly Publishing in the Age of AI

The rise of AI does not diminish the role of human expertise in scholarly publishing. It clarifies it. Authors remain fully

responsible for the accuracy, integrity, and originality of their work, even when AI assists with drafting or language refinement. Reviewers remain responsible for evaluation, which depends on disciplinary knowledge, judgment, and perceptual attention that cannot be automated.

The priority for scholarly publishing should not be to restrict AI-assisted scientific writing, but to strengthen the conditions under which human insight can emerge. These conditions include sufficient time for reading and review, diversity of perspective, fair recognition of editorial and review labor, and workloads that allow sustained attention. Without these foundations, the quality of the scholarly record deteriorates, regardless of how advanced writing technologies become.

AI changes the speed and ease with which scientific text can be produced, but it does not change the responsibility to ensure that this text carries meaning, validity, and insight. The quality of scholarship depends not on who drafts the words, but on whether those words faithfully express rigorous observation, sound interpretation, and genuine understanding.

AI can recombine what has already been recorded, but it cannot perceive. Originality arises when researchers read deeply, review carefully, and attend closely enough to notice what others have overlooked. This perceptual clarity advances disciplines, strengthens scientific rigor, and distinguishes meaningful research from superficial novelty.

In the age of AI, writing will no longer define the unique contribution of researchers or reviewers. Insight will. And insight emerges from the human capacity to observe, question, interpret, and perceive with clarity and care. AI is a powerful tool for the mechanical work of scientific expression, but it cannot replace the perceptual work of understanding. Reading and reviewing, not writing, are where the irreplaceable human contribution to scholarship truly resides.

Drowning in Plausible Nonsense: Should We Implement AI Prechecks for Hallucinations and Misconduct in Editorial Processes?

Diego Borbón

Generative artificial intelligence (AI) tools hallucinate. They fabricate citations, invent references, and misattribute ideas to real or fake authors. Mathematical proofs suggest this is not a fixable bug but a structural feature of probabilistic language models. This essay argues that publishers should consider implementing automated prechecks designed to flag hallucinated citations, fabricated references, and misrepresented claims before manuscripts ever reach peer review. The tools to do so already exist and are increasingly operational. Without such prechecks, editors and reviewers are forced to spend their limited, frequently unpaid, time performing what amounts to *forensic auditing*; a task for which the editorial system was never designed and cannot sustain. There is an *asymmetry of negligence*: the less effort an author invests in producing a manuscript written by AI, the more effort it demands from everyone else to detect, document, and dispose of it. If the problem was created by the irresponsible use of generative AI (GenAI), the beginning of the solution could, paradoxically, also come from a better-informed use of AI.

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Introduction

In 2023, with the boom of GenAI, Walters and Wilder¹ asked ChatGPT to produce literature reviews across 42 topics. Strikingly, 55% of citations generated by GPT-3.5 were entirely fabricated; for GPT-4 the figure was 18%.¹ Even among nonfabricated references, nearly a quarter contained substantive additional errors.

These are not marginal hallucination rates, as they describe the default behavior of probabilistic tools, now widely adopted by some to significantly boost their productivity and reduce the time it takes to produce a paper. For example, Kusumegi et al² found that scientists adopting large language models (LLMs) increased their publication output by 23.7%–89.3%. But, while the volume of AI-assisted submissions is rising, the reliability of their citational, substantive, and formal apparatus might not be.

This brief essay contends that editorial systems, which now receive significant amounts of manuscripts with documented hallucination rates, should consider implementing automated AI verification tools to precheck for hallucination in citation and references and to assess whether said citations misrepresent the cited authors' real claims and ideas. This would allow editors and reviewers to really focus on the main purpose of the scientific evaluation of manuscripts. And, for those papers that are flagged, following a human supervision of the automated results, editors could consider desk rejection instead of sending those manuscripts to reviewers, avoiding wasting the time doing otherwise.

This is not to say that publishers should adopt AI detectors and flag those that have a supposedly high probability of being AI generated. On the contrary, what the evidence suggests is that, first, AI detectors are not

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reliable, and are also biased against multilanguage authors, while ignoring the fact that a manuscript can be made with the help of AI and still comply with ethical, legal, and responsible standards and practices. What matters is not whether a manuscript was made with assistance of AI; if its responsible use shows an original input from the authors' ideas, a compelling and well-made argument, and has no hallucinations or misrepresentations, the use of AI can be accepted. What should matter then is whether the submission has profound errors in citations, attributions, and references to argue that it does not even grant the chance to be reviewed by others.

The Asymmetry of Negligence

We could call the *asymmetry of negligence* a structural condition that generative AI has introduced into academic publishing: The less effort an author invests in producing a manuscript written by AI, the more effort it demands from everyone else to detect, document, and dispose of it. An author can now generate a superficially competent and plausible manuscript in minutes, while conscientious reviewers, editors, and typesetters must then spend hours determining whether references, citations, and attributed/cited positions are real.

Frequently, an editor or a reviewer will receive a manuscript for which a significant amount of time would need to be dedicated for the labor of detecting false ideas, attributions, citations, and references, diminishing the time that can be dedicated to really assess what peer review is designed to evaluate: the quality of ideas and arguments; not checking for hallucinated mistakes. Then, generative AI has not merely lowered the barrier to writing plausible papers; it has obliterated it. And the editorial infrastructure built over centuries of voluntarism is buckling under the weight.

This is especially problematic, as Righi and Takács³ argued, because peer review constitutes a social dilemma in which noncontribution is the individually rational strategy. Bianchi et al⁴ showed that cooperation within peer review is extremely sensitive to external institutional conditions. But GenAI has radically altered those conditions. Before AI, the Publons⁵ report found that over 50% of review invitations were already declined, and 10% of reviewers performed half of all reviews. Aczel et al⁶ estimated unpaid review labor at over 100 million hours annually, worth more than US\$1.5 billion in the United States alone. This voluntary subsidy sustains an industry generating \$19 billion in revenue, with profit margins of 37%–40%.⁷ Asking these unpaid volunteers to now function almost as forensic auditors of AI-generated fabrication is a transfer of costs from those who profit and benefit from the system—including irresponsible authors—to those who fundamentally help sustain it.

The Feasibility Argument

The failure to implement automated citation-verification prechecks cannot be attributed to technological impossibility. For example, Scite.ai uses deep learning to classify citation statements as supporting, contrasting, or merely mentioning a cited work,⁸ currently indexing over 1.6 billion such statements.⁹ The STM Integrity Hub screens over 125,000 manuscripts monthly across 40 publishers, intercepting approximately 1,000 suspected paper mill submissions per month.¹⁰ Springer Nature has also deployed nearly 60 AI-powered tools across its editorial workflow, flagging 25,000 papers for potential integrity issues.¹¹ These are increasingly available tools, not just abstract hypothetical capabilities, anymore.

Limitations exist, of course, and they deserve honest acknowledgement. For example, the American Association of Cancer Research reported an analysis of 7,177 submitted manuscripts, finding that 36% of abstracts contained AI-generated text, but only 9% of authors disclosed its use.¹² The problem is that some of those analyses relied on an also unreliable (and sometimes off-point) tool: AI detectors.

Liang et al¹³ demonstrated that GPT-detection tools misclassify 61.3% of essays by multilanguage authors as AI generated. Hosseini and Resnik¹⁴ cautioned that current tools detect plagiarism of words but not misappropriation of ideas. These constraints do not justify inaction, as the use of AI detectors have, in my opinion, misguided AI's potential use in editorial processes.

What should matter for academic publishing is not whether someone used AI to assist research and writing, but whether its use compromises the basic requirements for science: citations need to truly represent someone's ideas, and the references included in a paper should genuinely represent the use of a real scientific precedent. Only then does it make sense to send a paper to a reviewer. If not, peer review would just turn into a complete waste of everybody's time.

When COPE first recommended the adoption of plagiarism-detection software, such as CrossCheck, the technology was also imperfect; its adoption was mandated not because it was infallible, but because it was available and superior to no screening at all. The same logic applies. Experienced reviewers rely on heuristic judgement, and those heuristics work when anomalies are exceptional. But when the base rate of citation fabrication and hallucinations are high, heuristic detection is overwhelmed: the cognitive system was not designed for an environment in which half of all references may just be complete plausible nonsense.

From a Logistical Gap to an Editorial Decision

The normative infrastructure for mandatory automated prechecks of hallucinations and AI misconduct already

exists, and the argument can proceed in three possible steps. The Committee on Publication Ethics Code (COPE) of Conduct and Best Practice Guidelines¹⁵ requires editors to take all reasonable steps to ensure the quality of the material they publish (§8.1), and recommends, as aspirational best practice, having systems in place to detect falsified data (e.g., inappropriately manipulated photographic images or plagiarised text), either for routine use or when suspicions are raised (§8, Best Practice). The Core Practices¹⁶ further requires journals to have clearly described processes for handling allegations of misconduct. If the availability of textual plagiarism detection generated an obligation to adopt it, then the availability of citation/reference/verification tools generates an analogous obligation. To accept one precedent and reject the other is an inconsistency, not a principled distinction.

Moreover, nowadays a regulatory asymmetry reveals the flaw. The National Institutes of Health¹⁷ and the Australian Research Council¹⁸ prohibit peer reviewers from using generative AI. And even some journals in *Nature*, *Science*, and *JAMA*, and some Taylor & Francis journals prohibit reviewers from entering manuscripts into chatbots—for justified reasons, of course. Yet Mollaki,¹⁹ as of 2024, found that most major publishers lacked specific policies addressing AI use by reviewers; although this picture has begun to evolve since, with several major publishers now issuing specific guidance for reviewers. This asymmetry, restrictions on reviewers while there is no corresponding obligation for editorial screening, is an institutional expression of the ethical omission.

The World Association of Medical Editors recommend that editors need appropriate detection tools, available regardless of ability to pay.²⁰ Without automated prechecks, the system delegates detection to reviewers and editors who generally lack a specific training for what can almost seem like a forensic auditing, and most have no access to verification platforms and, under open peer review, bear reputational consequences when undetected misconduct is published. This is a design flaw in editorial governance. The risk of automation bias²¹ is real, but it argues for human oversight of automated tools, not for their absence.

Scientific Integrity Under Threat

The stakes extend beyond the editorial workflow, and go even beyond what good science means, and what good faith entails. The academic citation/attribution/reference system is almost an act of epistemic trust. Cronin²² established that citing is a complex social practice embedded in recognition structures and knowledge claims. Nicolaisen²³ argued that citation behaviour is disciplined by a mechanism analogous to the handicap principle in evolutionary biology: authors avoid dishonest referencing because it threatens their reputation among knowledgeable peers.

Unfortunately, irresponsible use of generative AI dismantles this accountability mechanism and diminishes basic good faith and good science. Machines have no reputation to protect and no capacity for the intellectual engagement citation is meant to signify. When researchers have pointed out that between 14% and 92% of AI-generated citations are fabricated,²⁴ and when only 7% of AI-generated medical references are both authentic and accurate,²⁵ the citation becomes a simulacrum of trust; a structural ornament mimicking intellectual accountability while evacuating its substance. Citational integrity is a public good. Its erosion degrades the infrastructure of cumulative knowledge upon which all scholarship depends.

It is worth noting, in this regard, that the COPE position on authorship and AI tools is unambiguous: authors are fully responsible for the content of their manuscript, even those parts produced by an AI tool, and are thus liable for any breach of publication ethics.²⁶ The inclusion of fabricated references therefore already constitutes research misconduct and may lead to rejection or retraction, regardless of whether the fabrication was deliberate or inadvertent. GenAI makes inadvertent fabrication more likely, but it does not, and should not, change that outcome. Recent institutional responses are starting to reflect this principle. ArXiv, for example, has announced that authors who submit manuscripts containing hallucinated references face a 1-year ban from the platform, followed by a probationary requirement that subsequent submissions first be accepted at a peer-reviewed venue.²⁷ The signal is consistent with what is argued here: responsibility cannot be outsourced to the tool, and the failure to verify what one cites is not a minor lapse but a violation of the basic conditions of scholarly publication.

While it might be true that AI hallucinations might decrease with new and more robust models, the other crude truth is that it seems that fabrications are just a *natural* consequence of the probabilistic nature of GenAI. Kalai and Vempala²⁸ proved mathematically that any calibrated language model will inevitably hallucinate, since generating novel content from learned statistical distributions entails an irreducible probability of fabricating facts. Banerjee et al²⁹ extended this argument by showing that hallucinations are a structural property of LLMs rooted not only in probabilistic token generation but also in formal limitations, making them ineliminable regardless of architectural improvements or fact-checking mechanisms.

Then, it is almost safe to say that, at least for the near future, GenAI will hallucinate, and, as pointed out by Banerjee et al,²⁹ we need to live with this, but we should also do something about it, at least to not waste everyone's time in the editorial processes. Let's just think carefully what it means to not detect or precheck AI hallucinations in cited

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attributions and references. It means that either editors and reviewers will have to waste a significant amount of time reading the manuscript and then almost manually checking that citations and references make sense. Or it means that, if not detected, we are now publishing plausible but complete nonsense. Even if it passes through peer review, and typesetters then find hallucinations and errors in the citations and references after the paper was accepted, the solution cannot be to just correct the fabrications, as one cannot, in good conscience, conclude that the substantive content of the paper makes any sense, whatsoever.

Concluding Remarks

The question here is not whether fabricated citations will continue to enter the editorial process, but whether we choose to detect them before or after they waste everyone's time. The tools for automated citation and reference verification already exist, are already operational at scale, and follow the same logic that led the publishing community to adopt plagiarism detection software decades ago. The failure to deploy them is not a matter of technological readiness, but rather it is a matter of institutional decision.

Publishers who knowingly receive manuscripts with documented hallucination rates should consider the possibility of fighting irresponsible use of AI with responsible prechecks before transferring the costs of verification onto unpaid reviewers, overburdened editorial teams, and ultimately, the integrity of the published record itself. At the end, it is also in the best interest of the big publishers to avoid reputational costs, but also to keep the peer review system working. That starts by preventing the peer reviewers' work from becoming a waste of time and resources.

None of this implies that AI-assisted manuscripts should be rejected, flagged, or treated with suspicion simply because an author used a generative tool. What should concern us is not *just* how a paper was written, but whether its citations genuinely represent someone's ideas, and whether its references point to real scientific work. A manuscript that meets those basic conditions deserves to be reviewed on its merits, regardless of the tools used to produce it. A manuscript that does not meet them should never reach a reviewer's desk in the first place.

If the editorial system cannot reliably filter fraudulent and fabricated manuscripts, the entire architecture of science, that begins with the trust that one paper's citation of another represents a real engagement with real ideas, also begins to erode. The distinction is simple, the tools are available, and the cost of continued inaction is one the academic community can no longer afford. To avoid drowning in plausible nonsense, wasting everybody's time, it is time to think that maybe we should implement AI prechecks for hallucinations and misconduct in editorial processes.

Disclosures

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Helping Editors and Reviewers Understand Research Integrity Issues: An STM Workshop Report

Tony Alves, Sabina Alam, Daniel Acuna, and Jigisha Patel

As part of the 2025 STM Research Integrity Day, STM introduced a new element to the program: a series of expert-led research integrity workshops, held in parallel with the afternoon Innovator Fair. Designed as interactive, small-group sessions, these workshops aimed to move beyond awareness-raising and into practical, applied discussion around real-world integrity challenges.

The workshop focused on a critical pressure point in scholarly publishing: how research integrity professionals can better support journal editors and peer reviewers in identifying and responding to potential integrity issues during manuscript review. The session was aimed squarely at research integrity professionals and officers who are increasingly tasked with acting as translators between evolving integrity risks, editorial realities, and reviewer capacity.

The workshop was facilitated by an expert panel comprising Sabina Alam, Director of Publishing Ethics and Integrity at Taylor & Francis; Daniel Acuna, Founder and CEO of ReviewerZero AI and Associate Professor of Computer Science (on leave) at the University of Colorado Boulder; and Jigisha Patel, Independent Research Integrity Specialist and Founder of Jigisha Patel Research Integrity Limited.

Tony Alves (<https://orcid.org/0000-0001-7054-1732>) is SVP, Product Management, at HighWire Press. Sabina Alam is Director of Publishing Ethics and Integrity at Taylor & Francis. Daniel Acuna is Founder and CEO of ReviewerZero AI and Associate Professor of Computer Science (on leave) at the University of Colorado Boulder. Jigisha Patel is Independent Research Integrity Specialist and Founder of Jigisha Patel Research Integrity Limited. Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of their employers, the Council of Science Editors, or the Editorial Board of Science Editor.

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Setting the Scene: Taking the Temperature of the Room

The workshop began with a short series of live polls, run via Mentimeter, designed to quickly surface who was in the room, the level of experience participants brought with them, and the integrity pressures they were currently facing. Rather than serving as a simple icebreaker, the polling helped anchor the discussion in shared realities and highlighted the diversity—and unevenness—of experience, even within a relatively small group.

The audience identified primarily as publishers and research integrity officers, with additional participants selecting “other roles.” Only a small number identified as editors, and none identified primarily as researchers or librarians. This reinforced a key assumption behind the workshop’s design: While editors and reviewers are central actors in research integrity, much of the responsibility for supporting them falls on publisher-side and integrity-focused roles.

When asked about experience managing research integrity issues, responses showed a broad spread. Several participants described themselves as very experienced or moderately experienced, while the largest group reported having managed only a few cases. A small number indicated they had never directly managed a research integrity issue. Taken together, this suggested a mixed cohort—experienced enough to engage deeply with real scenarios, but not uniformly confident or specialized, underscoring the need for practical guidance rather than abstract principles.

Polling on experience with paper mill activity revealed that the majority of participants had encountered it in some form. Most respondents indicated they had direct experience investigating and resolving paper mill–related issues, while others had seen suspected activity without being directly responsible for managing it. Only a small minority reported no exposure at all. This confirmed that

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paper mills were not a hypothetical concern for the group, but an active and ongoing challenge shaping day-to-day editorial and integrity work.

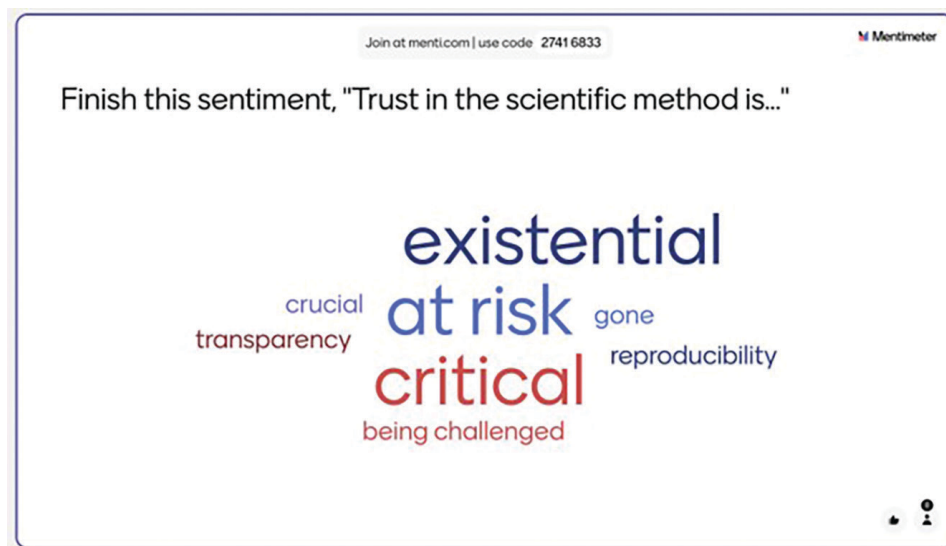
Participants were then asked about their biggest concerns regarding artificial intelligence (AI) in publishing and peer review. The resulting word cloud was dominated by themes of volume and scale—an avalanche of submissions, resourcing constraints, and the time and effort required to filter content effectively. Closely related concerns included fake papers, fake authorship, confidentiality of peer review, and the risk of penalizing good actors while bad actors exploit system weaknesses. The prominence of “resourcing” and “confidentiality” reflected anxiety not only about detection, but about sustainability and trust within existing workflows.

A similar pattern emerged when participants were asked to identify their biggest research integrity challenge overall. “Editor engagement” and “volume” stood out clearly, alongside paper mills, fake content, plagiarism, authorship disputes, and the difficulty of separating signal from noise. Several responses pointed to challenges around education and training—particularly how to engage editors who are time-poor, volunteer their expertise, and may be resistant to new tools or processes.

The final polling question asked participants to complete the sentence: “Trust in the scientific method is...” The responses were striking in tone. Words such as *critical*, *existential*, *at risk*, *being challenged*, and *crucial* featured prominently, alongside calls for transparency and



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reproducibility. This moment set a reflective, even sobering, frame for the rest of the workshop, making clear that the discussion was not merely about operational fixes, but about safeguarding confidence in the scholarly record itself.

Collectively, the polling confirmed several themes that would recur throughout the session: the scale of the problem, the strain on editorial systems, the uneven distribution of expertise, and the urgent need to rethink how editors and reviewers are supported—without overwhelming them—as research integrity threats continue to evolve.

Expert Perspectives: What Editors and Reviewers May Not See

The polling was followed by three short expert presentations, each highlighting a different dimension of the integrity landscape.

Jigisha Patel focused on legitimate publishing versus predatory publishing and paper mills. She emphasized that paper mills and predatory publishers are different, but related, entities. Predatory publishers have no quality control processes and often imitate legitimate journals to dupe researchers into submitting to them. Paper mills usually target legitimate publishers. She highlighted how, in legitimate journals, weak, inconsistent, or poorly enforced quality control measures, and editorial workflows that rely too heavily on trust without verification, can be easily exploited by paper mills.

Sabina Alam drew on publisher-level data and ethics case trends to show how research integrity concerns are evolving and increasing in volume, requiring publishers to continually adapt policies, workflows, and escalation pathways. Her presentation reinforced the idea that integrity oversight can no longer be reactive or handled in isolation but must be embedded across editorial operations.

Daniel Acuna addressed the accelerating role of AI, underscoring two simple, but profound, shifts: AI is becoming exponentially better, and it is becoming cheaper. He highlighted how this combination challenges traditional assumptions about what editors and reviewers can reliably detect, particularly as AI-generated manuscripts and reviews become increasingly polished and difficult to distinguish from human work.

Small-Group Discussions: From Policy Gaps to Practical Actions

Following the presentations, participants moved into structured small-group discussions, first in pairs and then in groups of 4, to work through a series of realistic scenarios drawn directly from the workshop materials. Discussion materials are provided as a supplemental material.

One discussion exercise asked participants to categorize a range of publishing practices—such as author-nominated reviewers, weak reviewer identity checks, and performance incentives tied to speed—as weak or absent policies, questionable practices, or outright publisher misconduct. The exercise revealed how difficult it can be to draw firm lines, particularly when practices sit in gray areas shaped by resource constraints or legacy workflows.

Another scenario focused on a journal experiencing a sudden surge in submissions of mixed quality, alongside rising postpublication integrity concerns and reviewer fatigue. Across tables, participants converged on a set of urgent actions, including pausing or slowing submissions, auditing the existing pipeline for red flags, reassessing published articles, tightening submission triage, and providing immediate support to overwhelmed editors.

A final scenario explored a near-future world in which generative AI models produce manuscripts and peer

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reviews that evade current detection tools. This prompted deeper reflection on what conditions are necessary to trust the scientific record at all. Groups emphasized identity verification for authors and reviewers, transparency through open data and open science practices, and a renewed focus on reviewers' ability to assess the *science itself*, rather than trying to detect AI.

Large-Group Reflections: Redefining Roles and Responsibilities

When the groups reconvened, several cross-cutting themes emerged. Participants repeatedly noted that editors are often only partially engaged, frequently volunteering their time and prioritizing scientific judgment over procedural or technical checks. Expecting editors to run tools, interpret complex reports, or stay abreast of rapidly changing integrity threats was widely seen as unrealistic.

Instead, there was strong agreement that publishers and research integrity teams carry the primary responsibility for staying informed about emerging risks and embedding safeguards upstream. Tools and checks should be run before manuscripts reach editors, with results summarized

clearly so editors can make informed decisions without being overwhelmed. Editors, participants argued, should not be expected to read lengthy guidelines; they need confidence that policies exist and that the editorial office will support decisions to reject or investigate when red flags arise.

Participants also highlighted the importance of researcher education and of framing integrity support in ways that do not alienate editors or reviewers. Human oversight and critical thinking were repeatedly emphasized, even as AI tools become more prevalent. As one discussion put it bluntly: *we cannot simply end up using AI to check AI*.

Closing Observations

By the end of the session, the workshop had achieved its core aim: surfacing what research integrity professionals collectively know, what they may underestimate, and where responsibilities realistically lie. Rather than offering a single set of prescriptions, the workshop underscored the need for layered responsibility—with publishers building robust systems and policies, editorial offices handling triage and escalation, and editors and reviewers supported to focus on scientific quality.

ScienceWriters2025 Highlights: Artificial Intelligence, Research Integrity, Science Communication, and More

Kyle Hickman, Ye (Vivian) Chen, Genevieve Makowski, Sophia Cela, Hussien Elkazaz, Mouttasem Albarodi, Emily Velez, Erin Wunderlich, Lalain Aquino, and Barbara Gastel



Addressing topics ranging from artificial intelligence (AI), to questionable research practices, to editor–freelancer interactions, ScienceWriters2025—organized by the National Association of Science Writers and the Council for the Advancement of Science Writing—featured virtual-only sessions on October 22–24, 2025, and in-person sessions in Chicago on November 7–9, 2025. The current report presents highlights of the virtual-only sections and selected in-person sessions.

Kyle Hickman (<https://orcid.org/0009-0007-5527-7292>), Ye (Vivian) Chen, Genevieve Makowski, Sophia Cela, and Hussien Elkazaz covered virtual-only sessions of ScienceWriters2025 as work for a graduate science reporting course at Texas A&M University. Mouttasem Albarodi, Emily Velez (<https://orcid.org/0009-0008-2029-7805>), Erin Wunderlich, and Lalain Aquino (<https://orcid.org/0009-0008-5655-5319>) attended ScienceWriters2025 in person through the graduate program in science and technology journalism at Texas A&M. Barbara Gastel (<https://orcid.org/0000-0003-0804-2953>) teaches the course and directs the graduate program.

Opinions expressed are those of the authors and do not necessarily reflect the opinions or policies of their employers, the Council of Science Editors, or the Editorial Board of Science Editor.

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The Truth About AI: How to Report on It Without Giving in to Hype and How to Use It in the Newsroom

By Kyle Hickman

The opening session of ScienceWriters2025 examined how journalists can responsibly report on AI, and how they can thoughtfully incorporate it into newsroom work. Moderated by Brittany Trang, health tech reporter at *STAT*, the session featured Ari Sen, investigative data journalist at CBS News, and Jeff Hargarten, data journalist at the *Minnesota Star Tribune*.

Sen began by outlining the fundamentals of AI, explaining that many public debates about the technology—whether it will eliminate jobs, cure disease, or pose existential risks—are best approached with a solid understanding of what AI actually is. He distinguished between algorithms, which follow explicit human instructions, and machine learning models, which infer patterns from data. Sen described how modern AI systems use vast amounts of text, image, and audio data to identify relationships, recognize language, and make predictions.

Sen encouraged reporters to dig into how AI models are built and tested, noting that their reliability depends on the quality of training data and on which outcomes developers choose to optimize. Evaluation metrics, he explained, determine how success is defined and can inadvertently shape real-world behavior. He also discussed the importance of fairness and transparency, pointing to high-profile cases in which biased data led to discriminatory outcomes.

Hargarten followed by discussing how AI can be applied in journalism itself. He highlighted uses such as automated transcription, document summarization, data cleaning, and idea generation. He cautioned that while these tools can streamline repetitive work and reveal new insights, journalists

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must disclose their use and ensure human oversight at every stage.

Both speakers agreed that AI should be covered with the same rigor as any scientific or political institution. When approached critically and ethically, they said, AI can enhance accuracy, efficiency, and creativity in journalism while reinforcing the indispensable role of human judgment.

Reporting Mistakes and Failure in Science as a Path to Trust

By Genevieve Makowski

Errors are inevitable in any field, but in scientific writing and science reporting, their effects can reach beyond a single incident. At this session, a panel addressed communicating appropriately about such errors. The panel was moderated by Brian Southwell (distinguished fellow, RTI International) and consisted of Annette Flanagan (executive managing editor, JAMA and JAMA Network), Ashani Johnson-Turbes (president, Society for Health Communication), Caitlin Looby (reporter, *Milwaukee Journal Sentinel*), Emily A Andrews (doctoral candidate, Northwestern University), and Ivan Oransky (cofounder, Retraction Watch; Editor-in-Chief, *The Transmitter*; and distinguished journalist in residence, New York University).

The panel began by discussing the importance of corrections. The panelists agreed that corrections are a net good for the scientific literature. Flanagan described the retraction and replacement process at JAMA, which lets authors easily correct mistakes that do not invalidate the science.

Next, the panel addressed reporting on controversial areas of science. Looby noted the difference between researchers publishing differing results and the use of “conflicting evidence” (or misinformation) as a political tool. Portraying science as a developing process and being careful not to repeat misinformation while reporting on contentious topics were strategies advocated to prevent misunderstanding among the public.

The panelists then discussed ways to regain audience trust after an error is published. Everyone agreed that choosing transparency over defensiveness is among the most impactful ways to rebuild trust. Other mentioned approaches included focusing on corrective steps, showing empathy and humility, and rebuilding trust through engagement. Johnson-Turbes noted that this process is audience-specific, as audiences’ histories with the scientific establishment will affect how they interact going forward.

The final segment regarded how AI is affecting scientific publishing. While AI itself brings in both benefits and problems, Oransky stated that the bigger problem is the

incentive structure that pushes researchers to cut corners and not check their work.

How to Spot “Questionable Research Practices”—and Never Be Fooled by Bad Science Again

By Sophia Cela

This session unpacked questionable research practices (QRPs)—research behaviors that fall short of fraud, yet still undermine the quality and credibility of scientific findings. These practices, which sometimes occur unintentionally, can bias results and hinder study replication. Moderated by science journalist Rose Rimler (senior producer, Science Vs podcast), the panel on this topic featured psychologists Jane Hergert (postdoctoral researcher, Humanistische Hochschule Berlin) and Tamás Nagy (assistant professor, ELTE Eötvös Loránd University, Budapest). Much of the discussion was based on the recent paper “Bestiary of Questionable Research Practices in Psychology.”¹ This paper, of which Nagy and Hergert were lead authors, expanded the number of recognized QRPs from about 15 to 40.

Rimler opened by acknowledging that the session’s title might be slightly exaggerated but captured its aim—to help journalists be fooled less often by weak or misleading studies. Drawing from the paper, she explained that about half of researchers across disciplines are estimated to engage in QRPs. Recognizing such practices, the panelists emphasized, is vital for evaluating research—an essential skill for science writers seeking to convey accurate findings.

During a question-and-answer segment, Nagy explained the presentation of their findings as a “bestiary,” a format inspired by medieval collections of mythical animals. The paper, he said, is a collection of QRPs and addresses their detectability, potential harms, preventive measures, warning clues, and stage in the research process. Making the metaphor more literal, he then presented 6 examples, each depicted as mythical “beasts”: biased manipulations, selective sampling, rule changing, ad hoc covariates, hypothesizing after results are known, and selective publishing. Nagy noted that some practices are problematic only when not transparently reported and that some familiar QRPs, such as p-hacking, are actually umbrella labels encompassing several QRPs.

To illustrate the content, Hergert led quizzes before and after Nagy’s overview, asking attendees to decide whether sample research scenarios were acceptable or questionable. Following the presentation, attendees showed greater confidence in recognizing questionable methods. In the final discussion, the panelists responded to attendees’ questions, including why such problems escape peer review and how journalists might address them with researchers.

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The session concluded with a link to the speakers' paper and a table listing all 40 QRPs, organized by research phase.

Cultivating Your Own Paying Audience: Entrepreneurial Science Writing for Newsletters, YouTube, and Podcast

By Ye (Vivian) Chen

This session discussed the challenges and opportunities faced by freelance science writers as they seek to establish their own channels. Moderated by Eli Kintisch, journalist and professor at George Washington University, the discussion featured insights from Justin Helps, writer, animator, and producer of the Primer YouTube channel; Colleen Hagerty, disaster reporter, *My World's on Fire* newsletter; and Cynthia Graber, cohost and cofounder of the Gastropod podcast.

Helps said providing valuable content is key to retaining an audience. He shared how he transformed his passion for biology and animation into a YouTube channel that visually explains science. He emphasized that passion, not economic goals, drives sustainable content creation. Hagerty and Graber explained how they turned their interests into niche content, advising others to research the market thoroughly and leverage networks. Meanwhile, both noted the balance between passion and financial realities. Hagerty said it took her two and a half years to become profitable; Graber said she spent 18 months preparing her podcast without income.

The speakers emphasized that building audience trust is essential. They described how, to ensure accuracy, they do fact-checking through experts, collaborators, or paid reviewers. Transparency also matters, they said. Helps said he openly communicates his mistakes to viewers. Hagerty said she explains her workflow to her readers, and Graber said she incorporates her personality into her podcast. In addition, the speakers indicated that strong branding sets a channel apart. Hagerty said she chose platforms that allowed her to own her content, design her own cover pages, and invite membership through a QR code. Helps said he designed a cartoon-style logo to differentiate his channel.

The 3 speakers also shared how to generate income while staying true to their content. They discussed the options of advertisements, subscriptions, licensing, and grants. Graber said she values subscriptions because they help her establish a direct connection with listeners. She also focused on podcasts instead of seeking a return on investment by expanding the channel. Helps said he rejected ads that compromised his content. Overall, the session's message was that science writers pursuing such entrepreneurial

endeavors must balance passion and financial goals and stay committed to their chosen path.

How Worker-Owned Media Outlets Can Work

By Hussien Elkazaz

Moderated by Ramin Skibba (freelance science, climate, and technology reporter), this session explored practical strategies for establishing independent media outlets. The panel featured Jason Koebler, cofounder of 404 Media; Maddie Bender, cofounder of *Sequencer* magazine; and Sabrina Imbler, staff writer at the worker-owned publication *Defector*. Together, they discussed lessons learned from founding new journalistic ventures amid instability in legacy media.

The panelists described their publications as responses to "corporate bloat" and editorial constraints in previous workplaces. Imbler noted that *Defector* emerged after former *Deadspin* writers resigned collectively when ordered to "stick to sports." Koebler similarly explained that 404 Media was created to "strip the company down to journalism itself," avoiding excessive executive overhead and allowing editorial independence.

Financial sustainability of their outlets, the speakers stressed, relies on subscriber-driven models and intentionally lean operations. 404 Media, which emphasizes transparency and "journalism with real-world impact," uses a paywall and offers subscriptions at US\$100 per year or US\$10 per month. *Defector* is funded primarily by roughly 42,000 subscribers, including a core base of about 20,000 who have remained since the outlet launched 5 years ago. *Sequencer* employs a flexible "pay-what-you-can" approach, with a typical subscription level of US\$6 to US\$7 per month that supplements its free newsletter.

Koebler emphasized keeping overhead "as low as possible." The panelists said that this financial independence enables a journalistic voice that rejects what they termed "false objectivity." Imbler said *Defector* is the first newsroom where they are "allowed to have a political opinion" and stated that such freedom "sharpens the coverage."

However, independence carries challenges. Koebler identified legal protection as the largest ongoing expense. Additionally, the decline of traditional social media platforms has made audience growth harder, pushing these outlets to depend more on direct referrals and community word-of-mouth. Still, the panelists agreed that the benefits outweigh the difficulties. Koebler said he now feels "more financially secure" than in corporate media "because we control the numbers." Bender added, "At the end of the day, I wouldn't do it if it wasn't fun."

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After the Pitch: Bridging the Editor–Freelancer Divide

By Mouttasem Albarodi

Scope creep, editor ghosting, and late payments are among the common causes of friction in editor–freelancer relationships. These issues were the focus of a panel that brought together science editors and reporters from US-based outlets to examine how tensions arise and how they can be managed.

Scope creep, the gradual expansion of a story's scope after reporting begins, emerged as a recurring concern. Panelists emphasized that it often reflects miscommunication. Freelance science journalist Sarah Scoles, a senior contributor to *Undark*, shared a practical tactic: placing the originally accepted pitch at the top of the draft to anchor expectations for both writer and editor.

Shi En Kim, a climate and science editorial fellow at *High Country News*, echoed that approach. “No surprises,” Kim said, stressing the importance of alerting editors as soon as reporting begins to shift. From the editorial side, Sarah Zielinski, print editor at *Science News Explores*, emphasized documenting expectations upfront. “If it's written down, there's no room for interpretation,” she said.

Panelists also discussed editor ghosting, when pitches or drafts go unanswered. They noted that silence often reflects workload rather than intent. Zielinski encouraged follow-ups and suggested escalating thoughtfully by calling the editor or reaching out to someone else at the publication. For time-sensitive pitches, Julian Nowogrodzki, science editor and newsletter lead at *Sentient Media*, advised clearly flagging urgency in the email subject and opening lines. Kendall Powell, senior editor at *Nature Careers*, who spent more than 2 decades freelancing before becoming an editor, noted that editors juggle multiple roles and deadlines, but that polite nudges are reasonable and should be expected.

Delayed payments also surfaced as a structural challenge. Zielinski described how *Science News Explores* has streamlined payments through standardized invoicing and automated systems, noting that editors who understand internal processes can better advocate for freelancers. “If you know the system well, you can hack it for your writers,” she said.

Scoles encouraged freelancers to plan workflows strategically by balancing quick-turnaround assignments with longer projects and to communicate transparently. Above all, she reminded writers that most editors want them to succeed and are balancing the needs of both readers and contributors.

How to Engage an Audience: Lessons from Fiction, Stand-up Comedy, and Shakespeare

By Emily Velez

This session featured lessons that science communicators have learned from their nonscience pastimes. Comoderated by Kathryn Jepsen, editor-in-chief of *Symmetry Magazine* (now physics editor at *Quanta Magazine*) and Madeleine O'Keefe, senior science writer at Fermi National Accelerator Laboratory, the panel consisted of Blythe Terrell, executive editor at *Science Vs*; Kate Gammon, freelance journalist; and Peter Jurich, freelance journalist.

Jepsen, who edits speculative fiction, emphasized the importance of tension in stories. In doing so, she introduced the M.I.C.E. quotient (milieu, idea/inquiry, character, event), each element of which can drive tension in a story. For example, in *The Hunger Games*, the concept of the games, an “event,” upends the world. Unexplained results in scientific research also can serve as sources of tension.

O'Keefe, who acts in Shakespeare plays, suggested ways for science writers to keep their topic fresh. Science stories can get repetitive, much like 400-year-old Shakespeare plays can. “Use it!” exclaimed O'Keefe, recalling the advice she received to show her personality and style in plays. Similarly, she said, your personality and energy should enliven your writing.

Terrell, who writes children's books, focused on her podcast *Science Vs* and the precariousness of finding the right tone. Although science can be serious, she emphasized letting scientists guide the humor, creating opportunities for their wittiness. This space for unserious moments shows interviewees that they can relax and makes for a more entertaining piece.

As a stand-up comedian, Gammon emphasized applying comedic skills to science writing. She especially highlighted the “rule of three.” This rule says the punchiness of a joke often relies on 3 phases: introduction, development, and punchline delivery. Using the rule of three, Gammon said, can make a science concept more memorable and make an audience more comfortable.

Jurich, also a stand-up comedian, discussed taking the time to figure out how you want to represent yourself. He presented questions to ask before diving into comedy or science communication: “What do I want to talk about?” “How do I deliver that message?” “How do I want people to feel?” From these answers, he said, he was able to establish a brand built on trust.

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When Reporters Conduct Mini-Research Projects to Tell Stories

By Erin Wunderlich

Moderated by Priyanka Runwal (associate editor, *Chemical & Engineering News*), this session focused on the experiences of 2 veteran investigative journalists who collected and analyzed their own data to tell stories.

Wendy Ruderman (senior health and science journalist, *Philadelphia Inquirer*) discussed “Toxic City,” a series she cowrote with Barbara Laker in 2019. This series exposed extensive lead paint issues in Philadelphia’s old housing and public schools. To gather evidence, her team collected neighborhood dirt samples, had teachers secretly gather paint samples, and reviewed documents such as those containing drinking water test results. The resulting series, which was a finalist for a Pulitzer Prize, led to a law mandating lead-safe schools and a \$15 million cleanup fund for Philadelphia.

Ruderman said that starting a project of this scale often requires outside funding—encouraging others to “apply, apply, apply” even if it is against the discretion of an editor. With regard to seeking out scientists and others to collect samples and run tests, she stressed the importance of avoiding conflicts of interest and adequately conveying to any exposed evidence-collectors the risk of participation.

Patricia Clarembaux (senior multimedia journalist, Univision Noticias Digital) led a multiyear investigation into immigrant farmworkers exposed to harmful pesticides in Florida, Michigan, and North Carolina. Using silicone armbands to detect up to 75 pesticides, and employing expert assistance in data interpretation, the investigation linked many cancer cases to exposure to common pesticides such as Roundup. The culmination was a multimedia story dramatically highlighting the impact of pesticide exposure on the individuals portrayed.

Clarembaux stressed the importance of collaborating consistently with scientists for fact-checking, noting that the team worked with over 15 experts from multiple states to verify data interpretation. Before publishing, she emphasized, it is critical to consult experts, contact lawyers, and review the story multiple times for accuracy. She noted that the ultimate goal was to “show the workers the numbers” regarding their pesticide exposure, so they were aware of the risks.

Thirsty Data Centers, Steep Emissions: AI’s Impact on the Environment and Public Health

By Lalain D Aquino

As AI continues to grow, so does the consumption of fresh, clean water to cool its data centers. According to a 2024 report from Lawrence Berkeley National Laboratory, data centers housing AI are estimated to consume 6.7% to 12% of

US electricity, and their direct water consumption is projected to double or quadruple by 2028. These rising demands on natural resources were the subject of a briefing by Shaolei Ren, associate professor of electrical and computer engineering at the University of California, Riverside.

“The actual, real story about AI water [use] is a lot more nuanced [than often portrayed],” Ren said. During this session, Ren explained how thirsty AI infrastructures influence our water, other aspects of the environment, and public health.

AI data centers, Ren noted, house powerful computers storing programs and large amounts of data—like a digital library—so AI systems can retrieve information to learn patterns, make predictions, answer questions, and perform other tasks. Extensive computing power is needed to run these AI systems, requiring data centers to have a steady flow of electricity, network connectivity, and reliable cooling systems to function.

Water, Ren explained, is a critical source of cooling. The water absorbs the heat produced by the computers, and some evaporates, carrying the heat away; the rest is recycled back through the system to repeat the cooling process. Without water, computers can overheat, be damaged, and catch fire. In such instances, service infrastructures powered by these centers, such as apps, hospitals, and banks, may stop functioning. However, the water used is often from the same source as that used by nearby residents.

In addition to issues regarding water, other environmental concerns exist. Backup diesel generators that are used during peak demand release air pollution, Ren stated. The pollutants—such as nitrogen dioxide, sulfur dioxide, and small particulate matter—can pose serious health risks to surrounding communities.

Ren noted that measures to lower AI-associated water consumption and air pollution are being explored. He stressed, however, the need for transparent reporting, smarter workload distribution, and thoughtful data center placement.

In closing, Ren acknowledged that AI has both benefits and costs. “It has some physical footprints, including energy, water usage, and public health impacts, but these are real costs just like in any other sector,” he said. “We need to face it, and we need to address it.”

Preparations for ScienceWriters2026 are now underway. The in-person component will be September 25–28, 2026, in Corvallis, Oregon, in partnership with Oregon State University. The virtual-only component will be October 14–16, 2026. For additional information, please see sciencewriters2026.org.

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The 2025 AMWA Annual Conference: Some Highlights for Editors

Katherine Hollen, Grace Aneska Cote, and Barbara Gastel

In keeping with its tagline, “The Resource for Medical Communicators,” the American Medical Writers Association (AMWA) provides guidance not only in medical writing but also more broadly in medical communication. Accordingly, its annual conferences include much of interest and use to editors. The current report presents highlights of 3 sessions of the 2025 AMWA annual conference, held November 5–8 in Phoenix, Arizona.

Tips and Tricks for Solving Common Grant Proposal Pitfalls

By Katherine Hollen

This session, led by Crystal Herron, founder and chief visionary officer of Redwood Ink, provided strategies to address common issues encountered when crafting grant proposals.

Herron identified a series of problems or pitfalls and presented advice on addressing each. The advice included the following:

- If a project seems inadequately matched with the funding call, consider adjusting the scope rather than devising a different project. Keep the audience in mind; ensure that the writing is clear, simple, and targeted to reviewers.
- Tell a story that flows smoothly and logically, with details that support the main message. Avoid disjointed writing that obscures the story.

Katherine Hollen and Grace Aneska Cote are 2026 graduates of the Texas A&M University master's degree program in science and technology journalism, which Barbara Gastel (<https://orcid.org/0000-0003-0804-2953>) directs.

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- To maximize impact, emphasize long-term goals by bolding them. Also explicitly connect the goals to the proposal's significance.
- Present statistical analyses, such as power analyses, clearly and in sufficient detail. Differentiate biological and statistical significance. Ideally, collaborate with a statistician.
- To help the team appear prepared and strategic, identify potential pitfalls and note alternative approaches.
- Link outcomes directly to goals; failure to do so can weaken the overall message.
- Reiterate the impact statement in multiple sections of the proposal to reinforce the proposal's message.
- Build credibility by detailing personnel qualifications and roles. To save space, consider putting such information in tables.
- Promote effective formatting by using templates.
- To help ensure timely completion of the proposal, prepare a timeline and include a buffer.

Kimberly Mankiewicz, scientific editor at The University of Texas Health Science Center at Houston, also was scheduled to speak, but she unexpectedly had to miss the session. However, she and Herron had collaborated in preparing the slides, and the content of the session reflected her input as well as Herron's.

Health-Literate, Designed Trial Results Lay Summaries

By Grace Aneska Cote

A lay summary of clinical trial results explains a study's purpose, methods, and outcomes to nonexpert audiences. As requirements for trial transparency expand, the need for such clear, accessible communication of complex research findings has become increasingly important. In this session, Matthew (Mat) Stevens and Anna Williams, both from Health Literacy Media, discussed how health literacy principles,

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paired with intentional design, can make trial results lay summaries more effective.

Stevens and Williams identified health literacy as a dynamic and evolving concept that extends beyond readability alone. They noted that approximately 40% of US adults read below the commonly cited sixth- to eighth-grade reading benchmark. They also emphasized organizational responsibility to present information understandably.

Other points included the following: Plain language is a tool—not an endpoint. Using shorter sentences, avoiding jargon, and applying thoughtful organization and design can support comprehension, but they do not themselves guarantee health literacy. Rather, health literacy is an outcome achieved when readers understand and evaluate information and use it to make meaningful decisions about their health.

The presenters outlined 4 evidence-based strategies for creating effective lay summaries. First, create a clear structure for easy navigation. Break dense text into manageable sections using consistent layout, visual hierarchy, and clear headings. To reduce cognitive burden, chunk information, minimize use of unnecessary abbreviations, and maintain consistent formatting.

Second, design to engage intentionally. Design should guide attention and signal importance rather than serve as decoration. Strategic use of color, font variation, and emphasis can highlight key messages while allowing less critical details to recede, creating a visual “language” that improves processing.

Third, present results thoughtfully. Visualize data only when doing so conveys a clear and meaningful story. Icon arrays and simple bar charts can effectively communicate risk and proportions, whereas overly complex graphics may overwhelm readers. Explain what the results mean, rather than having readers infer conclusions.

Finally, conduct audience testing. Formal and informal testing with intended audiences can reveal how the information is perceived and thus guide revision as trial communication continues to evolve.

Jam Session for Seasoned Freelancers

By Barbara Gastel

“Let’s not start with AI,” stated moderator Brian Bass, president, Bass Global, Inc, in opening this session. This

lightly moderated open discussion, with experienced freelance medical writers and editors sitting in a large circle, focused mainly on other topics. These topics included how to deal with unavailability to work, nonpaying clients, and slumps in workflow.

Early in session, the issue was raised of how to prepare for planned or unplanned unavailability to work. One participant said that before her maternity leaves, she identified for her clients some fellow freelancers she trusts. Another mentioned having instructed an employee what to do if the freelancer becomes unavailable because of an emergency. A third noted having a file, including instructions for contacting clients, for her sons to consult if she unexpectedly becomes incapacitated or dies.

For dealing with nonpaying clients—or better, preventing nonpayment—participants’ recommendations included the following: In deciding whether to pursue legal action, compare the expected legal fees and the amount of money at stake. In the contract for work, stipulate interest to pay if late. If a new client has an accounts-payable staff, contact it when accepting a project. Require payment up front or upon reaching stated milestones. Provide a discount (such as 15%) to clients who pay up front.

In 2025, reductions in the US government workforce and changes in US science policy affected the environment for freelance work. Some participants said they were having a slump year, some not. Participants offered advice for coping with or helping avoid such slumps. Among the suggestions: Touch base from time to time with entities previously providing work. Be engaged on LinkedIn. Ensure that listings in freelance directories are up to date. Have a diverse client base, to minimize effects of cutbacks by individual sources. When workflow is slow, take advantage of the time to learn new things. Create materials, such as newsletters, that can be of service and attract clients. Stay visible; in the words of one participant: “If you retreat into the mouse hole, no one will offer you cheese.”

The 2026 AMWA annual conference will be held November 4–7 in Washington, DC. For information, please see <https://www.amwa.org/page/conference>.

CSE 2026 Annual Meeting: Bull City, Durham, NC!

Carolyn deCourt and Mia Ricci

We had a blast hosting the 2026 CSE Annual Meeting in Durham, NC, also known as Bull City!¹ With the ongoing changes and uncertainty affecting us all, it has been more important than ever to come together as a community to navigate the societal changes impacting science and scholarly communications. We loved meeting and conversing with over 300 attendees in Durham in May, and we had a jam-packed schedule including new events and formats! Events took place onsite at the Durham Marriott City Center, which was steps away from the Durham Bulls athletic park, the Durham Performing Arts Center, the American Tobacco Campus, and many more dining, shopping, and other experiences!

After a buffet breakfast networking with colleagues old and new on Monday morning during the Business Meeting, we were thrilled to present the return of a Keynote Speaker this year! Wendy Queen is the Chief Transformation Officer at Johns Hopkins University Press and spoke from her extensive leadership experience guiding Project MUSE and shaping technology-driven innovation in scholarly communication. Wendy discussed collaboration across the scholarly ecosystem, and how it can help preserve trust, strengthen editorial practices, and ensure that the values of scholarly publishing remain visible in a more automated world. Following a short break, we debuted the CSE Lightning Talks, which focused on Professional Development, AI in the Wild, and Launching a New Journal.

A new offering this year was the Bright Ideas showcase during Monday's lunch. We enjoyed sitting back and listening to new and emerging ideas, products, and systems from CSE sponsors! Attendees voted on their favorite Bright Idea, and *Atypon*, A Wiley Brand: AI Companion won our



Parker Weisman, Mia Ricci, Carolyn deCourt, and Heather Travitz

first Bright Ideas Showcase award! Congrats to Michael Casp, Director of Business Development at Wiley, for presenting and securing this honor for *Atypon*.

Other award winners from the 2026 Annual Meeting include the following:

- Award for Meritorious Achievement: **Jonathan Schultz** for his work as Editor-in-Chief of *Science Editor*
- Distinguished Service Award: **Mary Billingsley** specifically in recognition of her leadership, dedication, and significant contributions to CSE
- Distinguished Service Award: **Heather DiAngelis** for significant contributions to CSE as Program Committee co-chair for the 2024 and 2025 Annual Meetings
- Distinguished Service Award: **Beverly Lindeen** for serving as the Managing Editor of *Science Editor* for the past 9 years
- Certificate of Appreciation: **Emma Shumeyko** for her important work restructuring the CSE committees
- Certificate of Appreciation: **Anna Jester** and **Rachel Taylor** for their work as co-chairs of the CSE Connect subcommittee and revitalization CSE Connect by improving the format to better serve participants
- Certificate of Appreciation: **Stephanie Valladao**

Carolyn deCourt is an Editorial Client Manager at Wiley; Mia Ricci is the Director of Publications Operations at the American Geophysical Union.

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and **Elizabeth Yopez** for serving as co-chairs of the Sponsorship Committee and driving record-breaking sponsorship success

This year's program boasted more than 20 concurrent sessions to choose from throughout Monday and Tuesday. Sessions covered such wide-ranging topics leveraging multimedia in Scholarly Publishing, mentorship, research integrity, international perspectives, state of the publishing job market, and more!

The final morning of the annual meeting once again featured the popular Ethics Clinic, hosted by the CSE Editorial Policy Committee.

The conference concluded with a general session inspired by tackling new age dilemmas for sustainable futures in scholarly publishing. This panel featured experts with unique domain knowledge and a breadth of experiences, discussing relevant topics such as ongoing digital transformations; shifting funding sources; emerging varieties of publication and peer review models; evolving research and publication methodologies; mounting concerns regarding integrity, accountability, and ethical practices; and a race to monetize data while responsibly navigating the still murky copyright domain, all this while maintaining trust and transparency.

The 2026 Annual Meeting also contained 5 short course add-on options, including the Short Course for Manuscript

Editors and the Short Course on The Business of Publication Management.² As in past years, short courses featured subject matter experts and took place on Sunday ahead of the main annual meeting events.

We had many attendees make the most of the various networking opportunities offered throughout the event in addition to the Welcome Reception, President's Reception, and Awards Luncheon. Back by popular demand were Dinner Conversations on Sunday and Monday evenings. On Sunday afternoon, we had a large group attend the Durham Bulls baseball game, and a group also joined now-President Brittany Swett on a walking tour exploring some of the favorites of downtown Durham. For the first time, we offered a Tuesday-morning run/walk led by Marshall Crawley, and we once again had on-site professional headshots. One additional new offering this year was the Mini Mentorship program, where those who signed up could meet up with a mentor/mentee while on site in Durham.

Thank you to all who joined us in Durham as we continue to navigate the changing scholarly publishing landscape together!

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1. <https://cse.memberclicks.net/annual-meeting>
2. <https://www.councilscienceeditors.org/short-coursesq-l>

International Perspectives on Scientific Editing and Publishing

MODERATOR:

Jonathan SchultzAmerican Heart Association
Journals**Hyun Jung Yi**Korean Council of Science Editors
and Hanyang University Guri
Hospital**Helen Tian**

MPS Limited, Greater China

SPEAKERS:

Vincent Kipkorir

AGC Tenwek Hospital/COSECSA

Shweta TanwarIndian Journal of Medical
Research, Indian Council of
Medical Research HQ

REPORTER:

Tony Alves

Scholarly Publishing Solutions

The global scientific publishing ecosystem is often discussed as a single enterprise, but the CSE Annual Meeting session “International Perspectives on Scientific Editing and Publishing” made clear that editors experience that ecosystem very differently depending on region, resources, infrastructure, language, policy environment, and research priorities. Moderated by Jonathan Schultz, in connection with a special issue of *Science Editor* on the same topic, the session brought together perspectives from Africa, India, Korea, and China to examine how editors are navigating shared pressures—visibility, equity, artificial intelligence, research growth, and trust—under very different local conditions.

Vincent Kipkorir, AGC Tenwek Hospital/COSECSA, opened with an African perspective grounded in his own editorial path across student-led, regional, and professional journals. His career trajectory, from *Annals of African Surgery* and the *Journal of African Medical Students* to the *East and Central African Journal of Surgery*, illustrated both the commitment and the structural constraints shaping many African editorial ecosystems. The challenges he described were familiar to many editors but intensified by resource limitations: limited funding and sustainability models, barriers to indexing and discoverability, reviewer scarcity and fatigue, manuscript quality gaps tied to training deficits, and uneven technological infrastructure.

A central theme of Kipkorir’s presentation was visibility. He noted that a large share of African journals remain difficult to discover through major channels such as Google Scholar, Scopus, and Web of Science, creating a cycle in which African researchers may feel pressure to publish African data in journals outside the region in order to gain recognition. This is not simply a problem of individual journal performance, he emphasized, but a systemic problem involving metrics, indexing standards, language, geography, and the global concentration of prestige. At the same time, he identified important strengths: strong mentorship cultures, early-career–led editorial and publishing initiatives, diamond open access models, and community-driven peer review. Looking forward, he argued that editorial capacity building should be treated as infrastructure. Training authors, reviewers, and editors; experimenting with mentored and flexible peer review models; recognizing reviewers; and building equitable north-south and south-south partnerships are all part of the sustainability equation.

Shweta Tanwar, *Indian Journal of Medical Research* and Indian Council of Medical Research HQ, then shifted the discussion to geographic differences in editorial practice and the potential role of artificial intelligence (AI). She framed the current publishing landscape as one in which Western Europe and North America remain disproportionately central, while high article processing charges, prestige concentration, and English-language barriers can marginalize researchers and editors from other regions. In that context, she presented AI not as a cure-all, but as a potentially useful tool for improving efficiency and equity when deployed thoughtfully.

Tanwar described several areas where AI could support editorial workflows: language support for nonnative English speakers, rapid triage and compliance checks, reviewer discovery, literature mapping, structured copyediting, and improved global accessibility. Her key point was that appropriate AI use can shift editorial attention from mechanics to scientific substance. If routine barriers related to language, formatting, and workflow can be reduced, editors may be better able to focus on the quality, relevance, ethics, and interpretation of the science itself. However, the equity promise of AI depends on access, transparency, governance, and local capacity. Without those safeguards, AI could also reinforce existing divides.

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Hyun Jung Yi, Korean Council of Science Editors and Hanyang University Guri Hospital, offered a more policy-focused view of AI through the experience of Korean journal editors. Korea's journal landscape includes many society-based journals that are strongly oriented toward international standards and global visibility, while small editorial offices remain common. In that setting, generative AI has rapidly become a practical editorial policy issue rather than an abstract future concern. Yi highlighted the roles of the Korean Council of Science Editors and the Korean Association of Medical Journal Editors, both of which have engaged directly with AI-related questions through education, guidance, and editorial policy development.

Two questions are now actively debated in Korea, Yi explained: Can authors use AI to help write manuscripts, and can reviewers use AI to help review manuscripts? For authors, the key issue is accountability. AI may assist with language, structure, or summarization, but authors remain responsible for the accuracy, originality, and integrity of the work, and AI cannot qualify as an author. Disclosure policies need to be clear, and AI-generated text, images, or analyses must be checked carefully. For reviewers, the central issue is confidentiality. A reviewer may want assistance organizing or drafting comments, but uploading an unpublished manuscript into an external AI system may breach confidentiality. Yi's summary was a reminder that AI policy must be specific to role, context, and risk: convenience cannot override accountability or trust in peer review.

Helen Tian, MPS Limited, Greater China, closed the session with an overview of the China Journal Excellence Action Plan and its implications for editors and publishers worldwide. Tian described the scale of China's research investment and scientific output, including 2025 research and development investment of approximately \$560 billion and 2024 output of 866,800 SCI papers, representing 32.9% of global share. Against that backdrop, the China Journal Excellence Action Plan is intended to strengthen domestic scientific journals, publishing platforms, talent development, and infrastructure so that Chinese journals can compete globally and retain a larger share of China-funded research outputs.

Tian explained that Phase I of the plan, from 2019 to 2023, focused on building quality foundations, sponsoring more than 400 journals, launching more than 120 new journals, and investing approximately \$200 million. Phase II, covering 2024 to 2028, moves from support for individual titles toward an ecosystem approach. Its projects include English-language journals, Chinese-language journals,

new journal development, talent development, and journal cluster pilots. Funding can reach up to 1.5 million RMB per year for leading journals and up to 10 million RMB per year for cluster pilot projects. The larger strategic objective is not only journal quality but also economies of scale, editorial talent, platform development, and digital sovereignty across a publishing ecosystem covering more than 1,700 journals.

For scientific editors, Tian suggested that China's priorities through 2035—AI, big data, integrated circuits, quantum technologies, life and health sciences, new materials, energy and dual-carbon technologies, advanced manufacturing, robotics, aerospace, major facilities, and mission-driven basic research—will create strong research pipelines in frontier areas. Journals with scopes that align with these areas may see opportunities for special issues, joint titles, society-China copublishing, and expanded interdisciplinary editorial expertise. For international publishers, the implications include both competition and collaboration: stronger Chinese journals will compete for content, high-article processing charge Gold Open Access models may face pressure from more affordable options, and platform sovereignty may shape expectations for hosting, workflows, metadata, indexing, and bilingual or multilingual publication strategies.

Taken together, the session presented a picture of scholarly publishing that is becoming more multipolar, more technologically mediated, and more explicitly shaped by regional priorities. The African perspective emphasized that visibility and capacity building are prerequisites for equitable participation. The Indian perspective showed how AI may help reduce barriers if implemented with attention to fairness and access. The Korean perspective demonstrated how quickly AI moves from experimentation to governance in small, internationally oriented editorial offices. The China perspective showed how national strategy, funding, infrastructure, and research priorities can reshape global publishing dynamics.

The session's strongest takeaway was that international collaboration is no longer simply a matter of outreach. It is becoming central to the health, legitimacy, and resilience of the scientific record. Editors everywhere are confronting common questions about trust, AI, peer review, language, discoverability, and sustainability, but the answers will not be uniform. A more inclusive publishing ecosystem will require shared standards and interoperable systems, but also respect for regional context, local infrastructure, and equitable partnership.

Taking Your DOI Metadata from Good to Great

MODERATOR:

Tony AlvesCofounder
Scholarly Publishing Solutions

SPEAKERS:

Amanda FrenchROR Technical Community
Manager
Crossref**Anna Wetterberg**

RTI Press

Annie GeringPublications Project Manager
Dragonfly Editorial**Ben Mudrak**Senior Product Manager
ChemRxiv

REPORTER:

Renaë Keep

SPIE

Metadata is an invisible infrastructure that underpins discoverability, analytics, and research integrity across the global research ecosystem.¹ Digital object identifiers (DOIs) are essential metadata for ensuring the discoverability, accessibility, and citation of scholarly content.

Crossref and DataCite are two prominent organizations that manage DOIs. While both serve similar purposes, they differ in their focus, coverage, and functionality: Crossref emphasizes scholarly publications, while DataCite specializes in datasets.

This CSE session, moderated by Tony Alves (Scholarly Publishing Solutions), emphasized the importance of Crossref DOI metadata. Crossref DOI metadata enables downstream systems to reliably surface content, track funding and institutional participation, and transmit vital trust signals. While journals typically register Crossref DOIs for all article content, the routine nature of the process can lead to declines in metadata quality. This CSE session provided practical insights for improving Crossref DOI metadata.

Amanda French, ROR Technical Community Manager for Crossref, noted that although the presence of a DOI alone says little about the quality or integrity of research, specific metadata elements—such as contributor identifiers, funder

information, affiliations, versioning, and policy metadata—directly affect how research is evaluated, reused, and trusted by external systems.

Crossref metadata is open, machine-readable, and available via application programming interfaces. Tools such as the Crossref Participation Reports² allow journals to assess metadata completeness and identify gaps or compliance issues, which are often tied to platform or XML workflow limitations. Each report shows the percentage of Crossref metadata records that include key elements.

There is always room for improvement. Anna Wetterberg (RTI Press), in partnership with Annie Gering (Dragonfly Editorial), provided a case study illustrating how CrossRef DOI metadata can be treated as a strategic, organization-level asset that supports mission-aligned goals for open science, transparency, and long-term discoverability. They recommended using the Crossref Participation Reports² and focusing on one element at a time.

Ben Mudrak, Senior Product Manager for ChemRxiv, noted that preprint metadata requires careful treatment of versions, including whether updates use component IDs or separate DOIs. There is a growing need for consistent structures and two-way metadata linking preprints, published articles, corrections, and retractions.

Overall, the session framed metadata excellence as both a responsibility and an opportunity: journals that invest in better Crossref DOI metadata strengthen their visibility, integrity signals, and alignment with the broader open scholarly ecosystem.

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<https://doi.org/10.36591/SE-4902-006>

Launching a Journal: From Vision to Publication—A Mini Workshop

MODERATORS:

Sara Kate Heukerott

Association for Computing Machinery

Claire Lee

Technica Editorial

SPEAKERS:

Elizabeth Yeppez

Elsevier

Meghan McDevitt

A&M Editorial Solutions

Nathan Taylor

Technica Editorial

REPORTING:

Ethan Feinstein

American Society of Clinical Oncology

The old flagship journals have been around for decades. But the scholarly space is always growing, and new journals are inevitable, whether it is to capture a new market or to take advantage of the large submissions coming to your existing journal portfolio.

What are the steps to create a new journal? That is what the panel discussed at CSE's 2026 Annual Meeting.

The theme of the workshop was clear: a proper foundation is crucial. As outgoing CSE President, Emilie Gunn, mentioned in her CSE Annual Meeting opening speech, many times the less exciting decisions are the most important to an organization.

Time to Ask Difficult Questions

Let us begin with the brainstorming around a new journal, which Elizabeth Yeppez, Business Development Manager at Elsevier, tackled. The right journal helps fill a need but for your team/society, you have to consider, what problem are you trying to solve? When you start crunching the numbers, does the data share your decision?

Then comes the tough conversation with your editors and any outside stakeholder. Tangible results will not come quickly. Indexing takes years, profitability takes years, and neither are guaranteed. Plus, authors feel less compelled to submit to a new journal. One of the carrots for these authors is to waive the new journal's open access article publication charge, which is a double-edged blade for a

journal, lengthening the timeline to profitability. Finally, you must consider that your flagship journal may be negatively affected as you spend time and resources on a new product. At this point it helps to reevaluate to see if it makes sense to continue.

Building Your Editorial Team

Once everyone is on board, there is more planning ahead of you. This was discussed by Meghan McDevitt, cofounder of A&M Editorial Solutions. You need foundational policies so everyone knows what to expect and so future staff who join your team later can keep everything moving smoothly.

Roles, term limits, evaluations, and policy documents fit into this bucket. Once those are complete, you move on to recruitment. In the early stages of a new journal, there is usually an idea of who would serve as editor-in-chief, but when it comes to associate editors and editorial board members, there will be a lot of searching and invitations. Diversity is an asset, and relying on your editors can help you accomplish this task.

The importance of this decision cannot be glossed over. Your editors and editorial board members are critical to bringing in content. They are the main reason for your journal's time-to-decision. And the right editor will also be an ambassador for your publication and will help solicit content and judge what is working and what is not. In many cases, the field you are covering is a community, and tapping into the players and potential articles are key to growth.

Picking Your System and Workflows

Time to start putting your decisions into practice. What system will you use? If you have a flagship journal or portfolio, then theoretically, all the heavy lifting is already done. For those without one, there is a long path of requests for proposals, sandbox demos, and training.

Alas, after this step, there are more questions to answer, and Nathan Taylor of Technica Editorial gave us plenty to think about. How do you want to tackle peer review, what formatting requirements will you require of your authors, and what goes into your template letters?

A key piece of advice for all of these steps is to document everything. It is not just to stay organized; for journals looking for indexing (which all should), documentation is a

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requirement. On top of that, documenting lets you monitor and report on your key performance indicators.

Reporting Becomes a Necessity

Reporting is a key facet of your current flagship journal, but in a new journal, the early data can either reinforce or contradict the mission of your new product. Thus, the early months of a journal are important, especially if you see the direction veer away from the key performance indicators you expected to see. Without an impact factor, measurements like time-to-decision and reviewer comments can keep authors coming back.

But it is not all about the speed and efficiency of your editorial office. What happens after a paper is published is just as important as the time it is under review. Where are your new papers being cited, and how much are they being read? The success of a journal is the culmination of internal workflows and postpublication visibility.

You may never get to a specific moment where a new journal “makes it”. There will always be goalposts to reach and new problems to solve, but a proper foundation and infrastructure go a long way to contribute to the final success of a journal.

From Uncertainty to Advancement: A Mentorship That Made a Difference

Ye (Vivian) Chen

One seeking to give direction, the other seeking to receive it. In 2022, when Denise Kuo and Heather Drought were matched through the CSE mentorship program, they were at different points in their careers. “I’ve often been in a position to train people, and I found that relationship at work to be gratifying,” Kuo said. After nearly 2 decades in various editorial roles, she felt ready to guide others interested in managing publications. Meanwhile, Drought, an assistant managing editor at the Association for Diagnostics & Laboratory Medicine, was looking to advance in her role. “I was hoping for guidance on how to set things up, address certain tasks or questions, and maybe find a way to move my role forward,” she said.

Kuo and Drought, who hadn’t known each other beforehand, started their first conversation simply trying to get a sense of each other’s personalities. They used CSE mentorship resources as a starting point, building talking points for the next meeting, and trying to structure their relationship.

For Kuo, those early conversations were exploratory and included learning what Heather’s job was like and how she might help. The hardest part was figuring out the goal. Drought said, “It took me some time to even formulate in my head what I wanted. Talking it out—going through some of the introductory questions and the follow-up questions Denise asked—helped create a path that really wasn’t there at the beginning.”

As Kuo and Drought met monthly, they gradually found a rhythm. They talked through what Drought was experiencing at her workplace. “I would ask all these questions as if I were the colleague next door, trying to help her problem-solve.



Denise Kuo

It was really about saying, ‘Let’s help Heather work through this particular thing,’” Kuo said. Kuo would then consider how she would handle the same situation and offer suggestions based on what she had done, or what she had seen colleagues do successfully.



Heather Drought

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<https://doi.org/10.36591/SE-4902-008>

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At the time, Drought was beginning a project that entailed reorganizing the editorial board of one of her organization's journals. She was unsure how to navigate this project, especially because she felt steeped in a certain way of doing things at her workplace, and she sought inspiration to see alternatives. Talking with Kuo helped her work through the challenges. Kuo provided an outside perspective and became a sounding board who could listen and respond with a broader range of experience. "Being able to ask questions—whether I thought they were silly or core—was incredibly valuable. Having that kind of outlook made a real difference," Drought said.

Kuo and Drought also developed an effective way to maintain momentum. At the end of each meeting, Kuo would give Drought an assignment to help her remember what they had discussed and reach a point where new action items emerged. "Looking back at my meeting notes, there were always things listed that were basically action plans for the next time we met. Whether I always completed them or only got partway there, it gave me some accountability, so the project didn't stall," Drought recalled.

As the pair continued working through the uncertainties that Drought faced, she completed the project. Everyone involved was pleased with the editorial board's reorganization. But a more meaningful change for Drought, who has now been promoted to managing editor, was in her approach to her work. She learned from Kuo how to communicate with her supervisor more effectively. Drought came to realize that in presenting ideas, she should support them with data and initial development. She now feels more confident proposing new ideas, and she perceives that this approach has improved her work.

Watching Drought and other mentees grow has been satisfying to Kuo, who now has her second CSE mentee. "Whether that growth is feeling confident enough to raise something with their supervisor, starting to manage their own team, or trying a new technology or task they haven't done before, I want to celebrate with them," Kuo said.

"When they're willing to take a risk and try something new, and it turns out well, it's fantastic. And even when it doesn't, if they step back and reflect on it, we can talk about whether they'd try it again or try something different. That willingness to reflect is amazing, too."

That growth goes both ways. Each mentee brings distinctive goals, strengths, and areas to improve, giving the mentor a chance to practice different mentoring skills and gain new perspectives. For Kuo, working with Drought was a good exercise in listening. She learned to give Drought the space to talk through what was happening at work; by listening instead of jumping in, she could better notice Drought's word choice and tone and offer more thoughtful suggestions. "If you're talking too much, you can't hear what the other person is saying, so I had to stop and listen, and that was important," Kuo said. She also has liked hearing how people in other organizations approach similar work differently and thus being reminded of how much colleagues across the field can learn from one another.

Their interaction has shaped how Drought and Kuo think about the CSE mentorship program. Drought said she feels that the program can support many kinds of ambitions, helping people pursue their goals or grow professionally. "I'd also say to try to keep an open mind, because you really have no idea what's going to come out of it," Drought said. Kuo emphasized that the willingness to learn matters just as much as having a goal. "Whether you have a specific idea of what you want to accomplish, you still want a relationship that puts you in a position to learn," she said.

Although CSE mentorships officially last 1 year, Kuo and Drought continue to connect. "It's a valuable program in the sense that it gives you support. Even if it hadn't moved Drought's position forward, I would have hoped Drought came away feeling she's not alone," Kuo said. "That she has people outside her organization she can rely on—people who can answer questions and help her problem-solve when she needs it."