

## Publishing in an era of excess

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Why publish? Probably there are as many answers to this question as there are authors. Accordingly, I answer from my own perspective, as a scholar employed in a university, a journal editor, and a science educator for 47 years. Throughout my career, my purpose in publishing was to share what I had learned from my research with the science education community. I enjoyed writing for journals and books and have not personally felt pressure to publish in order to keep my employment, obtain salary increases, or be more competitive for jobs. Simply put, I continued to do research throughout my career and to the extent possible I wrote regularly for publication. It is difficult to say how successful I was in maintaining balance in terms of the requirements of being a university level teacher/researcher. However, among the pearls of advice I was given during my doctoral studies was to routinely do research on my own teaching. The purpose of the advice was to use research to improve practice, but following the advice made it possible to maximize connections between teaching and research and not to feel that those activities were competing for my time.

In the sections ahead I address the pressures on scholars to publish in high impact journals and to be cited by colleagues, implications of quantifying scholarship in terms of the number of publications in high impact journals and the number of citations, using the literature in a context of excess publication and electronic accessibility of publications, and signs of excess publishing and consideration of the implications for the quality of science education. Finally, I provide a look ahead at what is to come in this issue, pointing out that there is considerable diversity among the authors of the papers that comprise this issue, the topics addressed and the theoretical frameworks that provide a foundation for the research and methodologies. On three occasions I provide comments from Catherine Milne, Peter Taylor, and Yew-Jin Lee, members of the Editorial Board, who participated in the review of this Editorial.

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## Pressures to publish and be cited

I am aware that other science educators (perhaps most) are under enormous pressure to publish, not only a certain number of manuscripts a year, but also in the “right” places. Journals and publishers are now ranked, not only by professors, departments and universities, but also by countries and regions of the world. In their professional lives academics contend with policies justified by neoliberal assumptions (Harvey 2005) associated with production, competition, meritocracy, equity, and accountability that permeate their professional lives in sinister ways to create myriad issues of social justice that are yet to be adequately identified and addressed. In universities around the world there is relentless pressure on scholars to publish in particular journals and to be cited by colleagues, creating contradictions for authors, reviewers and editors—contradictions that expand in number and nature, transforming continuously as the number of authors, submitted papers, and publications in science education rapidly increase.

The privilege of doing research carries a responsibility to disseminate what has been learned and thereby improve the quality of science education by adding to what we know and transforming practice. That is, the products of doing research should catalyze improvements in the institutions (e.g., research, policy and teaching/learning) involved in science education. Publication is the traditional way of meeting this goal by disseminating what was learned from research.

What characteristics of a published article are likely to afford science education institutions benefiting from research? There are many criteria that contribute to the quality of a manuscript and ultimately to the community. It goes without saying that before a manuscript is submitted for review, authors should ensure that their work is carefully edited and conforms to the style requirements for the journal. Above all, it is essential for manuscripts to add to the scholarly dialogue, showing an awareness of how the work presented in the new manuscript connects with other salient research already published in the literature, including CSSE. Not only is it disrespectful to fail to acknowledge the work of others, it is not scholarly.

Yew Jin: Yes and no; yes I don't like poorly crafted stuff but how else can scholars move ahead without writing something?

Ken: I am in favor of writing to learn—but I do not accept that everything written, or even most of it, should be published.

I do not regard publication as an opportunity for authors to sort out their early thoughts on issues. CSSE seeks articles that use sociocultural lenses in research in science education. I expect authors to have deep understandings of the sociocultural theory employed in their research and even though I accept an argument that writing is a good way to learn about a field, I hasten to add that only a small portion of what is written by an author should be published in books and journals. Publication is not just about writing but also is about participating in scholarly dialogue, in which the engagement of readers is central. It is also imperative that authors read and participate in dialogues with other science educators. It is difficult to see how publication in CSSE benefits science education unless all participants read as well as write, consider what is written, and participate in ongoing dialogue. An important criterion for deciding when a manuscript is ready for publication could be the extent to which the manuscript elicits/invites dialogue. It is not sufficient that only the forums associated with original papers assume the responsibility of fostering dialogue. I am sure that there are many ways to address the goal of fostering dialogue. Rather than monologues that seek to preach and convert, perhaps manuscripts could be authored as

invitations to consider, elaborate on, and adjust while transforming what is learned to suit institutional contexts that pertain to readers.

Peter: Writing with an educative intent to engage the reader in ‘pedagogical thoughtfulness’ (à la Max van Manen 1990), by posing questions rather than only providing answers, can be a hallmark of a reflective inquirer.

Engaging in dialogue extends beyond making sense of what an author wrote. As a reader engages with a written text, reproduction and transformation occur simultaneously as the reader connects her/his experiences with the meanings of the text. Reading text can also produce culture as the reader engages in activities such as summarizing and annotating. Dialogue can be regarded as the thread produced by interweaving understandings of text and knowledge from relevant professional experiences. Can papers be written with the potential to create networks of understanding that connect the meanings of a text with the knowledge readers have from their professional practice? Alternatively, is it necessary to publish papers in sets, as we do in CSSE, to ensure that each set is polyphonic and polysemic?

Yew Jin: I immediately thought of the bringing together of horizons in hermeneutic thought.

The pressure to publish or perish is creating contradictions for scholars, especially those who are untenured or who may be seeking promotion or competing for a new position. The response of many scholars to the pressure is to follow the advice of those who will likely sit on their promotion and tenure committees—publish regularly in high impact journals and find ways to get your work cited. To my way of thinking giving into these pressures is distorting the field, creating a vast sea of literature that may not be as useful as we would want it to be. How should scholars respond to reduce the distortion produced by the pressure to publish plenty in only those journals and with publishers regarded as the best?

Peter: Is this an indicator of the dominant research paradigm (positivistic scientism) reasserting itself, protecting its hegemony by privileging its own sources of legitimation?

### **Reducing the complexity of scholarly productivity**

The recent trend toward ranking journals and scholars was probably inevitable. I realized something was up when a colleague wrote to inform me that his doctoral adviser had an h-index that was equivalent to a Nobel laureate. Originally the h-index was proposed by Jorge Hirsch as a way to compare the productivity of theoretical physicists. According to Hirsch (2005), “the index h, defined as the number of papers with citation number  $\geq h$ , as a useful index to characterize the scientific output of a researcher.” The formula for calculating the h-index takes account of the most cited papers, the number of citations and the quality of the source of the publication and citation. The politics of the h-index are worrisome. The magnitude of the index depends on the database used in the calculation. So, for a given scholar it is possible to locate h-indices that vary considerably, depending on the database used in the calculation. Within a year I was asked specifically to refer to a candidate’s h-index in a review of his scholarly credentials for promotion and tenure. I was dismayed, because reducing scholarly productivity to a single numeral seemed overly reductive. On the other hand, I thought that including an h-index as one of many criteria to consider had some merit.

Narrow institutional reliance on indices such as the h-index can distort what it means to be a good scholar by emphasizing only those factors included in calculating the h-index.

Since the h-index does not take account of teaching and supervision it might not be good for the profession if scholarship was regarded primarily in terms of obtaining and maintaining a high h-index i.e., focused on publishing research in high impact journals and obtaining high citations.

“Not so fast!” In e-mail to a colleague I had just declared the h-index not to be very useful. He advised me about *Publish or Perish* software (Harzing 2010), which uses the Google scholar database to calculate impact indices. Once I figured out how to run the software on my Mac, I performed analyses for hundreds of my colleagues. The tool was convenient, useful, and quite dangerous. For example, in my own case, I saw how important it was to review every source the software included in calculating my h-index and also to be aware of what was excluded. A similar situation applies to reviewing the impact of journals. The software allows this to be done in ways that can counter the politically saturated system of classifications of journals produced by countries like Australia (some evidence suggests that the ranking committees elevated some local journals and demoted others with strong international credentials). Having said that, it is difficult to compare the impact of a relatively new journal like CSSE with the impact of a journal with a history of 50 years or more—even if the impact is calculated over the last 5 years. As is the case when any comparison of quality is concerned, it is important that the criteria that constitute the basis of the comparison are clear. Just for the record, using *Publish or Perish* I calculated the h-impact for CSSE as 12 with a total of 624 citations of 289 papers. Controlling for the years (2006–2010) *Research in Science Education* has an h-index of 11, based on 669 citations of 255 papers. The three most established journals in science education (*Journal of Research in Science Teaching*, *Science Education*, *International Journal of Science Education*) have h-indices that vary between 22 and 24 for the same 5-year period.

### Using the literature

How do you read journals these days? I no longer read the hard copy that regularly comes through the mail. My preferred way to access journals is through my library, using my desktop computer, usually from home but sometimes from my office. I use databases to identify literature that is germane to my interests. Since the most current articles are published in Online First or its equivalent, the best way to access the most current literature is through the use of search engines such as Google Scholar (<http://scholar.google.com/>) and Scopus (<http://info.scopus.com/about/>). Alternatively, relevant articles can be identified through searches of databases such as SpringerLink (<http://www.springerlink.com/home/main.mpx>). Having identified articles that are relevant to my research I read the keywords, title, and abstract. If I consider an article to be salient I will then download it as a PDF file, or if necessary, order it through interlibrary loan. Once I have the PDF file I usually read the article online using computer software to record my impressions—to create a dialogue associated with the text I find most relevant. Nowadays, I use MacSpeech Dictate (<http://www.macspeech.com/>), a voice to text converter, to create text files instead of using sticky notes available through PDF editors.

Cath: But also you do not want to feel that you are not keeping yourself informed of the research that is being published. I suggest that is a real tension for most scholars!

Peter: I strive to reinvigorate our field with perspectives based in literature, poetry, novels, art, music, film and so on...I believe it important to avoid being colonized by academic journals. Thus cursory browsing of journal abstracts is invaluable for me.

I am unlikely to read beyond the title, abstract, and keywords if an article does not appear to be salient and new. Presently science educators are deluged with professional literature. I access up to 11 English language journals that publish cutting-edge science education research. A search of the Google scholar database identified 825 articles published in these journals in 2009, the number per journal ranging from 11 to 216 per year. Clearly, selection is necessary since it is impractical for me to read every article published in this massive literature in science education.

The electronic availability of texts has created contexts in which large slabs of text are easily copied and pasted into document files. This process makes it easy to quote from papers verbatim (with attribution) and also to inadvertently plagiarize. There is an increase in the incidence of copying and pasting from one's own work and from other's work. It seems prudent for all authors to create a system for recording the source of all texts produced/copied during a review of the literature session.

A trend that is becoming increasingly apparent is for authors to submit manuscripts for review to more than one journal at a time. We have received manuscripts submitted to CSSE that we know have been submitted also to other science education journals and it is not uncommon for reviewers to inform us that they have been asked to review a given manuscript by two journals. Obviously submitting the same work to multiple journals is an unethical practice that should cease. In seeking a solution it makes sense to identify the reasons for the increasing incidence of this practice. Does it reflect high rejection rates and hence a way to hedge bets by being considered at the same time by multiple journals? Does it reflect pressure to publish from universities that monitor progress and advise untenured faculty about when and where to publish on an increasingly frequent basis?

### Signs of excess

Is there an excess of publications in science education? Obviously this is a complex question that warrants deeper analysis than can be accomplished here. Is it possible for a scholar to publish too many articles per year? Just as professional organizations have had to limit the number of papers that individuals can present at annual meetings, perhaps it is time to set limits on the number of papers that can be published per volume in journals such as CSSE. In my career I have published a lot, some might argue I have published too much. This may be beside the point. Setting aside the neoliberal notion that the criterion for equity is opportunity to compete in an open market place, perhaps it is time to set limits on how much an individual can publish in a particular year. I do not have a clear idea of how this might work, but I think the signs of excess are associated with myriad problems that warrant attention from science educators.

Peter: As the decades pass by very significant 'once-only' publications that shaped influential research programs pass from public consciousness. Fuelled by increasing competition to be constantly at the cutting edge of new ideas, new scholars are in danger of not learning from the history of their field. The re-publication of significant scholarly work can serve to refresh our memories and enrich our developing perspectives.

Ken: Just this week I read pre-published works from Emile Durkheim (1995/1912) and greatly appreciated the convenience of these works being republished with full and clear acknowledgment of the original publication details.

Are authors publishing much the same material in multiple places? As I was developing a proposal to undertake research on cross-generational scientific literacy I reviewed the scholarly literature to potentially inform this work and was surprised at the number of journals that were relevant and the extent to which science education colleagues published in them. However, in several cases I was concerned when much of the same paper was published in different journals. Since I had downloaded the papers already I was annoyed at the unnecessary expense and the waste of time involved in reading far enough into the paper to find that the percentage of new text was very low. With search engines being quite sophisticated these days I cannot see an upside to publishing much the same paper in multiple places. There are two caveats I offer to this otherwise blanket statement.

When I was in graduate school we were taught about our responsibility to reach out to different audiences, notably teachers, teacher educators, and researchers. Nowadays, policymakers might be added to that list. Different papers would be written for different audiences. It is essential that research groups disseminate to multiple audiences, but it is also imperative that they seek to communicate in ways that are not duplicative. With the changing faces of publishing and accessing literature has the need to write for multiple audiences waned? After all, I learned this lesson in graduate school more than 30 years ago during which time science education has changed dramatically.

Is there a case for publishing the same article in different places? Recently I sought permission to republish an article authored by Joe Kincheloe and me. I was preparing a second edition of a book Joe and I edited and a paper on the “death of positivism” seemed to fit very well in that book. In fact, the idea of writing the article arose from a critique of the book I was revising. Following Joe’s death I decided to publish the article in CSSE so that science educators would benefit from a publication that in many ways defined what Joe stood for (Kincheloe and Tobin 2009). As I completed the revision of the second edition of the book the article clearly fitted as the first chapter. Accordingly, I sought permission from Springer, who granted permission provided that I clearly acknowledged the original publication details. This is quite a common occurrence and it is essential that readers know the article is reproduced and the original publication details are provided clearly.

It has been a tradition in science education to revise for publication papers that were initially presented at the annual meeting of a professional organization. Recently, organizers have made it convenient to disseminate presented papers from conferences through the use of DVDs, CDs, and electronic downloads from conference websites. The question for editorial boards to consider is whether articles disseminated in this way can be republished in journals. Usually the professional organization allows authors to do this, however, if an article were available electronically, why would a journal republish that article? If republication occurs, what proportion of the text can be the same? What acknowledgments are necessary so that readers are apprised that the material is republished? Given the plethora of published material it seems timely for editors and editorial boards to look carefully at issues associated with republication in its myriad forms.

### **About this issue**

Twenty-eight authors from 11 countries contributed to the papers published in this issue, 17 females and 11 males, and approximately equal numbers of senior and junior authors. Of the 12 authors from the United States half are ethnic minorities (Hispanic, African-American, and Asian-American).

The issue consists of six sets of papers, an original paper and a forum comprising one or more reviews that expand the conversation, introduced in this issue in an “original paper.” The paper sets examine diverse issues set in countries around the world. These include: 5-year-old children in Brazil collaborating with teachers in curriculum design; the resilience of scientists’ and teachers perspectives’ on the nature of science; role forces and resources to support new science teachers in an urban school; collaboration between schools and museums in China; undergraduate level physics at a Mexican University; and identities of science faculty who get involved in the education of K-12 science teachers. The paper sets include rich sociocultural frameworks associated with cultural sociology, cultural historical activity theory, sociology of emotions, actor network theory, and situated learning. Consistent with other signs of diversity in this issue of CSSE, the six sets of papers incorporate diverse methodologies and associated methods.

### Join the dialogue

Consistent with publications in CSSE opening up a dialogue I invite letters and Op-Ed articles for on any of the issues addressed in this Editorial or other papers published in CSSE. Sonya Martin will serve as editor of Letters and Op-Ed pieces that address science education as it is represented in CSSE and/or sociocultural perspectives on science education as you experience it.

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