

Editorial

“Scientific Writing for Impact Is a Learned Skill—It Can Be Enhanced with Training”: An Interview with Patrick O’Connor

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Dr Patrick O’Connor is a scientist based in Adelaide, Australia. He works for The Centre for Global Food and Resources, University of Adelaide, as an Associate Professor, and he is also Principal Consultant of his own consultancy company, O’Connor NRM (www.oconnornrm.com.au). As a frequent visitor to China and as a Professorial Fellow of the Institute of Urban Environment, Chinese Academy of Sciences (CAS) in 2016–2017, Patrick has a special connection with Chinese scientists, in that he has, above all, been a research collaborator with his Chinese colleagues. He has also been known for his co-teaching of courses and workshops on writing for international publication in China since the early 2000s with his long-term language professional colleague, Dr Margaret Cargill, who is also based in Adelaide. Their co-authored textbook, *Writing Scientific Research Articles: Strategy and Steps*, published by Wiley-Blackwell (2009, 1st edition and 2013, 2nd edition), has achieved highly successful sales around the globe¹.

Patrick does not always join Margaret on teaching trips to China; when he does, he typically combines the co-teaching calls with his research commitments at CAS institutes in the country. His dual commitment to applied scientific research and teaching of scientific writing is probably quite rare among scientists. Importantly, what distinguishes him from some of his fellow scientists who may also have an interest in discussing or teaching scientific writing [1]² is his commitment to drawing upon applied linguistics approaches to inform his co-teaching and co-development of publication pedagogy with Margaret [2,3]. In an environment where subject teachers and supervisors in disciplines may often lack interest in joining hands with English language teachers in enhancing novices’ potential for successful publication, an environment which seems to have some global ubiquity and is apparently characteristic of Chinese universities, Patrick’s views, as will be revealed in the interview below, are significant. It is hoped that both the subject teachers and supervisors in disciplines and the English teachers will find his perspectives enlightening.

The interview text to be presented below is based on a series of interviews conducted by Yongyan Li with Patrick, between 28 October and 3 November 2018, at a university in mainland China, where Patrick and Margaret Cargill were on a teaching visit. These interviews were conducted as part of a larger on-going project that aims to understand the emergence of EAP (English for Academic Purposes) in China [4]. Margaret and Patrick, through their regular teaching visits to China since the early 2000s, have made a unique contribution to the development of EAP and English for Research Publication Purposes (ERPP) pedagogy in the country; their pedagogical perspectives and practices

¹ As of July 2017, 15,000 print copies of the textbook had been sold, including 6500 print copies of the second edition.

² This is an opinion piece that Patrick and Margaret responded to with strong criticism recently (see [2]).

are, thus, an important component of the above-mentioned research project. Margaret's story has been featured elsewhere (see [5,6]); it is pertinent and apt to present Patrick's as well. In addition, gaining insights into a scientist's views on teaching and learning ERPP has wider implications: despite language professionals' long-standing pursuit of interdisciplinary collaboration in trying to foster discipline-integrated models of language support [7], sustained language-content partnerships are rare and discipline specialists' direct involvement in team-teaching with a language teacher is hard to find [8]. The story of a scientist who has persisted in collaboration and co-teaching with a language specialist colleague for two decades is, thus, worth telling, and it is likely to inspire interdisciplinary collaboration in contexts where such joint endeavors are urgently needed.

It will be seen that Patrick has some criticisms to make on Chinese scientists' publishing practices (e.g., "The Chinese scientific machinery is focused on volume and its measure of quality is the Impact Factor of the journal, not the ultimate contribution of the article"). Given the more favorable portrayals of China as a giant of scientific output [9], an external alternative view is a healthy reminder for Chinese scientists and policy-makers.

Yongyan Li (hereafter "Yongyan"): How did you start to teach writing for international publication? What has motivated you to do this, as it seems very few scientists would seriously pursue such a commitment long-term?

Patrick O'Connor (hereafter "Patrick"): I think that my personal interest in this comes from several places. One is my experience in Vietnam where I went for four months before my PhD to explore the possibility to do doctoral research there. There I realized that there were people who want and who could publish, but that it is a challenge. So when I was thinking about going back to Vietnam to conduct my PhD research a little later, I thought about this capacity thing. I thought for Vietnam to improve its science, the scientists need to interact more in the conversation with all other scientists in English; they must be able to write things that can make it to the conference, or abstract, or papers. I was able to get a small grant to go back to Vietnam to conduct some training on English publication which attracted some scientists from different universities in the country. So that is how it started for me. Then I was introduced to Margaret in Adelaide by someone and discussed my training plan with her; we saw eye to eye, so we went to Vietnam together in 2001 to conduct some more serious training. Later, through the introduction of a Chinese Academy of Sciences (CAS) visitor at Adelaide, we came to China in 2002 for the first time and gave a series of workshops on publication skills at the CAS Institute of Soil Science (Nanjing).

The second reason behind all this is, I am a farm boy—on the farm, you try to do what you can with what you have got. You do not try to spend lots of money to have equipment that you will not get a return from. So you are looking all the time for efficiency and how you do things and optimize the effort you make. That is the working perspective on the farm. The third reason is in ecology. I am interested in systems ecology: How do organisms live together in symbiosis? And how do they efficiently connect with each other, so that they deliver benefits to each other even at some cost? My PhD was actually about how plants in a community live together and they have a fungi living on their roots transferring nutrients between the plant and the fungus; and how does this relationship mediate the relationship between the plants, leading to a change in the system. Where the bottleneck is in the system, that is where you put the effort to make the system flow better. So from the ecological and working upbringing perspective, I was always interested in how we overcome a bottleneck and how do we use the right tools to efficiently do that. In the world of science, where the primary outcome is knowledge actually recorded so that others can use it, the key bottleneck is the ability to describe what you have done. This I realized on my first visit to Vietnam; but probably I realized more than before after I met Margaret. There is a pedagogical requirement to overcome that bottleneck. It is not a simple solution, and there is no magic pill, but there are mechanisms.

Yongyan: It seems such a “pedagogical requirement” aimed at training students’ scientific publishing ability is not yet systematically responded to at Chinese universities. But at the same time, we have been seeing reports on the rapid growth of the scientific output of the country at the international level. What is your take on this?

Patrick: In some reports [9], when they write China is Number 1 or Number 2 in a certain field, in a search engine, or say China is Number 2 in citations, they were doing it by quantity, not quality. If you multiply the number of papers by the amount of time spent by Chinese scientists, students, and others per paper, it is a massive cost. Then you have the lost cost of failing to get attention by poor structure, poor composition, inadequate use of language, etc. That alone is a massive cost, not just for Chinese science, but across the world. Even first language writers can fail. You could write another article which is on the massive cost of Chinese publication inefficiency in science. The Americans are the leaders in publishing, China the second, and the English and the Germans the third and the fourth; but the English and the Germans jump past China for efficiency. China is Number 10 or 12 maybe in terms of efficiency, if measured by citations per publication.

The Chinese scientific machinery is focused on volume and its measure of quality is the Impact Factor of the journal, not the ultimate contribution of the article. It is assumed if you get your article into a good journal, then your article will be well used; but the evidence does not support that. It is rare that a Chinese scientist’s paper exceeds the Impact Factor, in my observation. That is partly because the pressure on Chinese scientists is high. So they are shopping for the best journal they can get into. They would try to get into a journal with an Impact Factor of 7; maybe they get in but they only get 5 citations. It’s most obvious in PLOS One (an open access scientific journal) (<https://www.plos.org/>), whose Impact Factor has come down until it meets the citation rate of Chinese contributions. That is sad. So the citation starts very high because lots of good Swedish and American scientists said, yeah, I like that model, I like the idea, I am going to publish my good work there. And then when the Impact Factor is high, the Chinese flood the market—they jump in and try to get their papers in, but that drags the Impact Factor back down to the Chinese level. The journal Impact Factor rating is not smooth; it is a stairway. In my field, between Impact Factor 15 and Impact Factor 7, there are almost no journals. It is a big step. There are only one or two in between, which may have a particular focus on evolution or animal ecology or something, so you may not have the choice to go in between. So, the ability to really generate novelty, the structure, and the linguistic capability, that is what drives you up in the Impact Factor list or at the end generate citations.

In the early 2000s when we started to come to China to offer the training, I suggested to a senior manager in CAS that they could create a CAS-linked, a small center of scientific writing; from that, work it out for all other CAS institutes, and develop a really well-designed curriculum, methods, tools, and online resources. I said this maybe at a banquet after a few beers; when you are drinking the beer, everyone thinks it is a good idea, but nobody did anything afterwards. There was a lack of systemic readiness for that vision. I even gave a lecture a few times called something like “Why Chinese scientific publications are poorly cited”. But most scientists said, “Oh, what are you saying, no, we are doing really well.” I said “No, you are getting about half the citation you should.” Scientific writing for impact is a learned skill—it can be enhanced with training.

Yongyan: You are very insightful. It seems some opportunities have been missed in China in the past for training novice scientists to write. What should such training be like then? There are some “classic” books on scientific writing [10], while training workshops delivered by scientists or journal editors are also found on campuses sometimes. In what ways is your approach, as reflected in your co-teaching with Margaret and in your textbook Cargill and O’Connor ([3]), different from others’ approaches? It is so rare to see a book co-authored by a language professional and a scientist.

Patrick: All other books that I have seen about writing a scientific manuscript talk about writing the sections in order (from the introduction to the end). That is wrong for a start. That way does not

build the manuscript. We talk about starting from the results section, which is the key driver of an article (see [3]). Most books try to cover multiple genres so that the paper writing is one part of it. That can be confusing, as there are just key points. But the main problem with the other books is that they are mostly about *what* to do. We talk about *how*, combining genre analysis ([11,12]) with other applied linguistics elements that Margaret brings to it, like how to write with “flow”, and what author-prominent and information-prominent citations mean in creating arguments—all of those things bring a “*how*” to the task. These elements together are very rare in other books. They say when you write the introduction, you should cover the existing literature and talk about why you are doing the study; but do not say *how* to do that.

So our approach is about the two parts, or language elements (facilitated by the use of corpus methods) and the genre analysis together, within the framework of understanding what a scientific article is trying to do [13]. And I think there is a depth to that from Margaret’s experience with scientists and my experience as a scientist, and they come together to help the reader see what they need to do. There are books written just by scientists, or just by language people. But even if you get somebody who is a bit of both, it is typically someone who has been trained in science, but has turned to professional teaching of writing.

Yongyan: As a scientist, what is your position on genre analysis? I understand that you have taught writing on your own several times. How do you use genre analysis in your teaching? More broadly, how do you teach writing on your own without Margaret?

Patrick: I have only recently started to run a few teaching sessions on writing—I do not do this for a profession. Recently I was asked to teach a class of students (in Adelaide) how to write a research proposal; it was for a Masters course in research methods. I told the class what the proposal has to do, what the requirement of a proposal is, and then I showed them an example. I told them about the stages of an introduction and said the proposal is essentially an introduction to a study that leads on to a plan and budget. I got them to recognize the stages of introduction in the example proposal, and then write dot points for their own proposal against those stages. On my cover slide was a cartoon of a flying superman with his X-ray vision looking into this genre. What I wanted to show to the students is that genre analysis would give them a more in-depth view of what is going on in that genre, and how the language is constructed. Rather than facing the blank page, they actually face a set of stages they can prepare for. In the *Superman Comic*, superman is the hero; but in daily life, he is just an ordinary man and his name is Clark Kent. So the students come in as Clark Kent, and we give them the ability to have X-ray vision, like superman. They come out with increased confidence, a set of new capabilities, a new vision. That is where the picture of superman comes in.

I am not an expert in genre analysis, but if I look at the genre of something, I look at what is going on in that. And my own writing is very much influenced by my understanding of the composition of writing. So, in the things I write for policy (in connection with my role in my consultancy company), I am always thinking: What are the elements I am going to include here? How will that look?

Back to my teaching of writing, on another recent occasion, I was in Perth to do some research collaboration, so I offered a one-day course to some students on writing. I modified training to fit more with me teaching on my own, with me bringing in more. Because I was in a better English environment, I can bring in other exercises that are a bit higher standard, that require quite a bit more English. Actually all the students, almost all the students in my Faculty are from overseas, from second language environments, but they are in Australia speaking English every day. So the standard is a bit higher. I started with the same materials that Margaret and I used, and edited them down to reduce the amount of second language material, or focused on the things that I thought would be most useful in that context.

Probably when I teach on my own, I teach a lot less about some of the things that I teach when I am with Margaret—data presentation and things like this. I actually think that most scientists, science groups, are very good at data presentation and understanding that. The other thing is, since we started software for producing images and figures, they became so sophisticated that you can't possibly teach how to make figures. You can only talk about principles really and some of that. When I teach on my own, I probably concentrate more on some of the applied linguistics, but that is because Margaret does it when we are together. I would almost always teach about the introduction section and the stages [3]. I will probably teach a bit about the process of creating a manuscript by reference to a map I have developed subsequent to the publication of our textbook. In light of the mapping process, when you develop dot points for the results, you consider at the same time the writing of the discussion, and the key things you have to put back into the introduction, so that when you go to write the paragraphs you already have the starting material. Often the dot points become the basis for a topic sentence. So you can start with the data and it grows out more organically.

Yongyan: Both the literature and your experience show that supervisors are often not very keen to train students to become better writers of research. Why so from your perspective? You have referred to your use of applied linguistics approaches in your teaching of writing in the above. What does applied linguistics bring to potentially make a difference?

Patrick: Why are there not more supervisors who value the kind of training that is possible. I think one, they have no faith in training. Lots of scientists and researchers do not really want to teach. They do not think teaching is actually a very good use of their own time. So they probably do not think it is a very good use of anybody's time. They know that it is necessary, but they do not see it as a primary way of learning. They do not necessarily value education; they do not necessarily know that the students are struggling or how much time is wasted. They are frequently too focused on collecting the data and analyzing the data and they understand very little about the real problems faced by students to publish.

To me, the supervisors in China are much more in command and control than those in Australia. The students are tied to the supervisor for the duration of their candidature, and the main answer to their supervisor is "yes". The supervisor just says: "Work harder, be here longer!" I think few supervisors understand how much time students waste in conceiving their ideas, in organizing their information in presenting it the first time. And when they have a language barrier, it is doubly difficult. The supervisor just thinks the students should work harder. But from the perspective of economics, every time you do something, you are not doing something else; there is an opportunity cost for everything you do. So if the student works harder, if they change from working eight hours a day to ten hours a day, they take two hours away from something else that may also benefit them. Eventually you get no additional benefit for the extra time, because the benefits of playing basketball over three years could be much greater to the total productivity of the student than the extra two hours in the laboratory going over the same sentence.

Supervisors do not want to admit that students should have training, as traditionally the science supervisor makes the students write the paper by apprenticeship; every scientist thinks he is a scientific writing trainer. Every scientist believes that they can train the students³. But they do not have a model of efficiency for training. If you think that it is just a matter of harder work, then you have not found the pathway through the problem. I think the pedagogy provides the pathway. However, not every science supervisor can even understand what applied linguistics can do for them. They think it is just a different method than what they are already doing. I do not want to say it is arrogance, but maybe some conceit. Some ignorance about pedagogy, about how people learn. They think that if you

³ In English as an Additional Language (EAL) contexts, many supervisors may have difficulty writing in English themselves. Evidence for this concerning Chinese-speaking scientists has been revealed in some studies [14,15]. It may be even harder to expect them to provide proper training in English scientific writing to their students.

put content in front of people, they should absorb the content. And that is all there is to the process. So then they say: "Here is the content, here is an example paper. You write your paper like that paper. Go! Begin!" How do students learn? It does not start with the content. It starts with the process. And what I am saying is that the average science supervisors are often very smart, very good at absorbing content, but have little understanding of how people learn. And it is also frequent that scientists have difficulty in understanding how somebody else can be different in the way that they approach learning than themselves.

There is nothing wrong with the modeling. The difficulty in scientific writing, particularly to a high standard where you want to go to a journal with an Impact Factor 3 or 4, is you need a lot of exposure to the models, which means the reading, but then you still have to create novelty even when you are an apprentice. You have to demonstrate the novelty of your work and you have to look at *how* that is done. What choices you make to construct your argument, use language, create the flow. There are so many options. You have to have very high language competency to do that easily. You have to have a *framework* for doing it; and the framework is not immediately obvious in the paper. What I think applied linguistics brings to it and what we tried to bring in our teaching maybe was a particular insight.

Institutions themselves invest in English language training and they think the science and the English language training could just meet in the dark, and marry. They do not meet in the dark. They are going opposite directions. So that is the problem.

Yongyan: Your criticism of the status quo is very insightful. In addition to the change that supervisors need to make, in your view, is there room for improvement in how Chinese students approach their work, as this clearly impacts upon their success in international publication?

Patrick: I do not mean to generalize but from my observation, Chinese students are not individually inquisitive enough—although of course we find such students in other countries too. They do what they are told. And they wait to be told. It takes them a long time to think for themselves. And even then they think for themselves, it is often within a restricted framework. They do not really take control of their own research so that they are doing a piece, like a piece of work in a laboratory, and the technicians do some other parts. They do not really embrace it and say, "This is all my problem and I have got to work all over it." I think that is an important part of taking the position of yourself as a researcher to go through that. A PhD in science is not easy to do, even if you want to do it. You can face many challenges. But I think in the Chinese system, if you are good at study, you will be channeled towards a PhD. Whether you are channeled through the right subjects, into the right area, and whether you are ready to change later after you realize "actually, I do not care about that type of science or discipline", are questions that can pose a challenge for the student.

Of course my perspective is limited to my exposure. But I think a student who was really engaged in what they were doing will be throwing their hand in the air and asking questions in the class. And we do not see that very much in China, even when they warm up. When they warm up, it happens a little more. But many of them are just saying: "I want my paper so I can graduate and get out of here." In my case, by the time I started my PhD, I had wandered around the world for six or seven years, working in all kinds of things. So my perspective on doing a PhD was very different, but my boldness to do that was much higher.

Yongyan: Will you continue to come to China with Margaret to teach workshops and short courses on writing for international publication at CAS institutes and universities, apart from conducting joint research projects with your Chinese counterparts?

Patrick: Margaret is winding down in her career. I have been privileged to work with Margaret, who is an extraordinary teacher. She is a good companion to go to strange places and we worked very well together. She is irreplaceable. For me, I do not plan to have a career in teaching scientific writing. It is just an additional thing to what I am already doing. I will remain interested in the teaching. I probably would do it if I thought there was value somewhere, because I am interested in working with a group of people or a research institute. I am always interested in students, in new places and new things, but I am not trying to make a career of scientific writing and teaching. I do not intend to go around teaching. I do it as a service when somebody asks me. If opportunities arise, I would look at them, but I am not busy creating those opportunities.

Yongyan: Thank you very much for sharing your perspectives. We do look forward to meeting you every now and then in China in the future, both as a scientist and an educator dedicated to helping scientists and students to produce writing that will go high on the league tables of citations.

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