

I Hear the Train A Comin' — The Rise of China

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In his featured presentation at last November's **Charleston Conference, Association of Learned and Professional Society Publishers (ALPSP)** Chief Executive **Ian Russell** spoke persuasively about the "next big thing" in scholarly communication. In **Ian's** mind, the rise of China as both a consumer and producer of research would profoundly influence the space in the decade to come. Given the tight 20 minute allotment the Charleston forum provided, it was difficult to delve into this provocative prognostication in substantive detail. The rise of China, a popular topic sure to be ubiquitous as the **Beijing Olympic Games** approach this summer, is a fascinating subject that deserves a bit more attention in the scholarly communication space.

Let's start with the basic facts as they pertain to China. The Chinese population exceeds 1.3 billion, more than 20% of the world's total. Its economy has averaged 9%+ growth for each of the last 20 years. It has more than 2,000 universities and six million enrolled higher education students. (Of less relevance here but still interesting for anyone writing a book report, ice cream was invented in China 4,000 years ago, it borders 14 other countries, and it produces more cotton than any other nation in the world.)

Where these statistics start to gain relevance to this discussion are in the trend lines. China's **GDP** investment in research and development will grow from around 1% earlier this decade to 2.5% in 2020. In terms of raw funding, the government's annual commitment has already tripled in the last decade. What does this money buy? Better facilities, equipment, and infrastructure, to be sure, but also better talent. As recently as 1999, more than 80% of scientists who left China for academic degrees and postdoctoral training did not return. Higher pay and performance incentives make it easier to retain a significant portion of top

researchers who might otherwise go abroad to conduct their work.

The quantity of Chinese scholarship is clearly on the rise. Higher education enrollment in China has increased more than five-fold since 1996. According to the **Chinese Education Ministry**, more than 25 million students now attend Chinese universities. The number of Chinese scholars who read, write, review, and edit journal articles is, not surprisingly, steadily climbing. For example, China had a 20-fold increase in publications in international scientific journals from 1981 to 2003. From 1999 to 2004, it moved from tenth to fifth in terms of the volume of indexed articles originating from its shores to be indexed in *Web of Science/Science Citation Index*, trailing only the United States, Japan, the United Kingdom, and Germany. (For more on this citation growth, I recommend *The Emergence of China as a Leading Nation in Science* by **Ping Zhou** and **Loet Leydesdorff**.) It should be noted that acceptance in *Science Citation Index* journals has become a stated goal of the Chinese government (see *China's Quantitative Expansion Phase: Exponential Growth but Low Impact* by **Bihui Jin** and **Ronald Rousseau**). Researchers are often rewarded for such publications, an extension of the investments and incentives outlined above.

As yet, this quantitative explosion has not, at least by some key indicators, been matched in quality. To quote **Jin** and **Rousseau**, "According to data from **ISI's Essential Science Indicators (ESI)** (November 2004) China ranked 9th in the world according to the number of published papers over the period January 1994 to August 2004. It ranked 18th according to the number of received citations. Yet, for the number of citations per paper China ranks only 124th. Such a drastic contrast between these three indexes tells us again that China's science is only in a 'quantitative expansion' phase."

What are some of the factors holding back the "cite-ability" of Chinese scholarship? Language is certainly one. Through the early 1970s the number of Chinese students learning English was negligible. The older generation of Chinese scientists is less likely to have a firm command of the language. English is now compulsory in Chinese high schools and even some primary schools. The number of Chinese people learning English today is in excess of 100 million. As a nuanced grasp of the English language becomes more widespread, it is reasonable to expect that Chinese-authored papers will improve in readability, quality and, by extension, impact.

Plagiarism is another concern. **Harvard** mathematician **Shing-Tung Yau** and **Yale** evolutionary biologist **Stephen Stearns**, among others, have called attention to the prevalence of plagiarism within Chinese higher education. **Stearns** encountered several examples of lifted passages during his stint as a visiting professor at **Peking University** last year. He wrote a passionate letter to his students (see <http://www.xys.org/xys/ebooks/others/science/dajia8/beida8.txt> for the full transcript) decrying what he saw as an endemic pattern. "Disturbingly, plagiarism fits into a larger pattern of behavior in China. China ignores international intellectual property rights. [**Peking University**] sees nothing wrong in copying my textbook, for example, in complete violation of international copyright agreements, causing me to lose income, stealing from me quite directly. No one in China seems to care. We cannot do science if we cannot trust what others publish. There is no reason to try to replicate a result if it cannot be trusted." This appears not to be an isolated incident. In 2006, the Chinese government released the results of a government survey of 180 Ph.D. holders, in which 60 percent admitting to copying the work of other scholars (see **Paul Mooney's** "Plagued by Plagiarism" in *The Chronicle for Higher Education* for more on this topic). Whether the changes vowed by **Peking University** administrators and other Chinese academic officials — including threats of firing and the creation of a master database of plagiarism charges — adequately address the international audience's wariness of Chinese scholarship will take some time to assess.

How will the scholarly communication adapt to the Chinese influence? What will the composition of academic content creators and consumers look like in a decade's time? How will standards and expectations change in the face of a more diverse author base? These are fascinating questions I hope to revisit in these pages frequently. I am certain I am not the only one with a vested interest in how this all plays out. 🌱

Rumors
from page 12

continued on page 16