

The Science and Development Network (SciDev.Net) and UNESCO

# 'Effective science communication in an era of globalisation'

A workshop for science journalists from East Asia

9 – 13 March 2006

Graduate University, Chinese Academy of Sciences, Beijing, China

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## Contents

1. Introduction and summary	5
The need for science journalism training	5
2. Workshop trainers and speakers	6
3. Workshop programme	8
4. Workshop photos	9
5. Workshop opening ceremony	10
6. Workshop training: Science journalism skills	11
Introduction to China's science communication and requirements on science journalists	11
How to find science news	12
How to write science news and features	14
Science feature writing	15
Selling stories to the editor	16
How to distinguish between real and false science	17
7. Workshop training: Internet skills	18
How to evaluate the quality and credibility of website information	18
8. Workshop training: Dialogues with scientists	20
Key science issues in water sector and their relevance to reporting	20
The operation, management and evaluation of China's science system	21
Science ethics and its relevance to journalists	22
Science journalism and the environment	23
Natural disasters and science reporting	23
9. Feedback and conclusions	25
Feedback	25
Individual comments	25
Conclusions	26
Appendix	27
List of participants	27



## 1. Introduction and summary

In March 2006, under the funding from UNESCO (The United Nations Education, Scientific and Cultural Organization), the Science and Development Network (SciDev.Net) conducted a workshop for science journalists from East Asia. The workshop was jointly organised by SciDev.Net, the Research Centre for Science and Technology Communication at the Graduate University of Chinese Academy of Sciences (GUCAS), and the China Society for Science and Technology Journalism (CSSTJ). Besides funding from UNESCO, the workshop also received funding from the UK embassy in China for the UK trainer's travel and accommodation, and the funding from British Council China towards publishing costs for a book detailing the results of the workshop.

Contributions towards the preparation and implementation of the workshop were provided by the Chinese Academy of Sciences (CAS), the China Association for Science and Technology (CAST), the China National Commission for UNESCO, *Science* magazine, the International Research and Training Centre on Erosion and Sedimentation (IRTCES), and US Environmental Defence.

A total of 26 science journalists and science communicators from China, Mongolia and the Democratic People's Republic of Korea (DPRK) attended the workshop, with training and lectures provided by 13 trainers and speakers from China, the UK, and the United States.

The workshop aimed to help science communicators grasp the key aspects of science policy making, science ethics and environmental science communication, and the production of timely and accurate news stories and features about research appropriate for different readers and audiences. Due to the increasing diversification and professionalism of the natural and environmental sciences, it is impossible to cover all fields in a five-day workshop. However, by selecting some typical subjects and with delicate analysis and training, the workshop organisers were still able to equip science communicators with the necessary skills and thinking on where to get science news, how to report science accurately and how to deal with a science-related crisis.

The main workshop training took place on 13 – 16 March at GUCAS, Beijing, where multimedia teaching facilities and Internet connections were available for both teaching and communicating. Workshop activities included a combination of lectures, group discussions and training in journalism skills.

The workshop also emphasised the benefits of using the Internet to find news stories and gain a greater appreciation of the vast range of science resources available, including SciDev.Net's own dossiers and E-guide to science communication. [1] [2]

### The need for science journalism training

The role of the media in spreading news about science and technology has long been stressed. However, media reports of science in China have been criticised as low quality. A number of factors contribute to China's poor science communication. One is the lack of scientific knowledge among science communication professionals. [3] Others include institutional factors such as a lack of competition between and within journals, the closed management system of scientific publications and science institutes, and the absence of a communication mechanism for scientists. [4] A recent case study by workshop organiser Hepeng Jia highlighted the lack of professionalism among China's science journalists — such as a reluctance to check

[1] SciDev.Net dossiers. <http://www.scidev.net/dossiers>

[2] SciDev.Net E-Guide to Science Communication. <http://www.scidev.net/ms/sci%5Fcomm/>

[3] Fang. Z. Challenges to China's Science Popularization (Chinese). Available at:  
<http://207.152.99.250/~myscience/magazine/200211/021117.htm> (23 November 2002)

[4] Liu. H. Science Communication under the Concept of Grand Science (Chinese). Available at:  
<http://www.gmw.cn/01gmr/2000-11/02/GB/11^18592^0^GMC2-010.htm> (2 November 2000)

facts with scientists or science institutes or to reference academic publications, and a tendency towards sensationalism rather than scientific accuracy. [5]

On the other hand, training on science journalism is scarce in China. In her application form, Li Chen from Science Times stressed that there have been virtually no activities of this kind in the science reporting field, yet it is one where training is even more important given the complexity of the issues are involved.

Aware of these problems, the workshop organisers planned the training programme with the aim of helping to improve not only science journalism skills but also to provide a starting point for mutual communication between science journalists and scientists or science policymakers. Accordingly, the workshop consisted of three parts, selective science or science policy knowledge, journalism training, and how to interview scientists or science policy researchers.

## 2. Workshop trainers and speakers

Yang Mo is the professor and the deputy director of Science Communication Centre of the Graduate School at the CAS. Before joining the faculty, Mo was a senior science journalist of China Industrial and Commercial News of the Computer World, becoming an assistant to the chief editor before leaving. She now organises and chairs the science communication programmes of CAST.

Julie Clayton is a freelance science journalist, editor and workshop coordinator for SciDev.Net. She previously organised three workshops on titled 'The Use of ICTs for reporting on HIV/AIDS research' for UNESCO and SciDev.Net, held in Uganda (April 2003), India (November 2003) and Thailand (2004), and another for SciDev.Net on reporting about malaria research in Cameroon (November 2005). She began her career as a research scientist in immunology, and then switched, 12 years ago, to science publishing and journalism. This included two years with the journal *Nature* as an editor, handling immunology and HIV/AIDS papers, and three years with the BBC. During the past six years she has reported from international conferences and written news and features for many publications including SciDev.Net, *New Scientist* magazine, *Lancet Infectious Diseases*, *Nature*, *Nature Medicine*, and *Christian Aid*.

Richard Stone is the current Asia editor of *Science*, based in Bangkok. He graduated from the University of California, Santa Cruz, United States, with a MSc in science communication in 1991 and has worked for *Science* as writer, deputy news editor, European news editor and now Asian news editor. Between September 2004 and July 2005, he was a visiting scholar at Kazakh National University, Almaty, Kazakhstan, where he researched the legacy of the Semipalatinsk test range in northern Kazakhstan.

Jianyu Zhang, China representative of the US-based non-governmental organisation (NGO) Environmental Defence. With a masters degree at Tsinghua University, China and a PhD in science policy at Carnegie Mellon University, United States. Zhang has been active in pushing China's environmental science programmes, especially the remission trading programme.

David Concar is the first secretary of science section of the UK embassy to China. He began in journalism career at *New Scientist* magazine and has a PhD in science. After starting his career in diplomacy in China, Concar has been active in supporting the development of science reporting. Under his strong promotion, the UK Embassy and the CSSTJ launched a science-reporting award for Chinese science journalists in 2005.

Lei Xiong is executive editor at China Features, affiliated to the Xinhua Agency. Xiong has been an investigative reporter in health issues. Her works include a series of investigative reports on illegal gene exploitation by the Harvard School of Public Health in China (2001-2003). She is the senior reporter of

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[5] Jia. H. The Challenge of Internet on Science Journalism in China. CSSTJ seminar presentation. (5 November 2005)

China's science-related issues for *Science* magazine. Xiong has also been an active communication researcher whose recent interests are focused in bioethics.

Hepeng Jia is SciDev.Net's regional coordinator for China and a science feature writer at *China Daily*, the country's only national English newspaper. In 2002, he became a frequent contributor to SciDev.Net and helped organise contributions from other correspondents. Since 2003, he has also written for *Nature Biotechnology* and *Nature Medicine*. He has authored papers on *The Media's Role in China's Transformation* and *An Analysis of Paid Journalism* and presented his research on SARS, bird flu and transparency at the Fourth World Congress of Science Journalists, Montreal, Canada.

Other trainers and speakers included:

- Zhouzi Fang: US-trained biochemistry PhD, chair of xys.org, science columnist.
- Luchuan Ren: professor at CAS's graduate school, secretary general, Risk Evaluation Committee, China Society of Disaster Prevention.
- Xiaomin Zhu: associate research fellow, Institute of Policy and Management, CAS, science communication researcher.
- Shouren Xue: director of the Institute of Journalism, *Science and Technology Daily*, former director of International News *Science and Technology Daily*.
- Zhiqiang Hu, science ethics researcher, Science Communication Centre, CAS Graduate School.
- Yangui Wang: professor and director of training department from the IRTCES.

### 3. Workshop programme

Monday 13 March

Welcome address from Dr Zhonghua Ye, vice-president of GUCAS; Y. Aoshima, director UNESCO Office Beijing and UNESCO representative to China, DPR Korea, Japan, Mongolia and Republic of Korea; Tracy Driscoll, senior communications manager, Cultural and Education Section of the British Embassy (British Council China); Dong Liu, section chief for urban science popularization of CAST; and Ying Ding, director of science popularisation office of the CAS.

**Session 1:** Introduction to China's science communication and requirements on science journalists, Shouren Xue

**Session 2:** How to find science news, Julie Clayton and Richard Stone

**Session 3:** Key science issues in water sector and their relevance to reporting, Yangui Wang

Tuesday 14 March

**Session 4:** The operation, management and evaluation of China's science system, Xiaomin Zhu

**Session 5:** Science ethics and its relevance to journalists, Zhiqiang Hu

**Session 6:** How to write science news and features, Julie Clayton and Richard Stone

**Session 7:** How to edit science news and features, Julie Clayton

Wednesday 15 March

**Session 8:** Science journalism and the environment, Jianyu Zhang

**Session 9:** How to evaluate the quality and credibility of website information, Julie Clayton

**Session 10:** Science feature writing, David Concar

**Session 11:** Participants exchange views, discuss their projected assignments

Thursday 16 March

**Session 12:** Natural disasters and science reporting, Luchuan Ren

**Session 13:** Selling stories to the editor, Julie Clayton

**Session 14:** How to distinguish between real and false science, Zhouzi Fang

**Session 15:** Lessons of Columbia University's science journalism and conclusion, Yang Mo

Friday 17 March

**Session 16:** Practising sessions for participants

#### 4. Workshop photos



Workshop participants and trainers. Front row (left to right): Choe Yong Il (DPRK), HONG YONG-IL (DPRK), Julie Clayton (UK), Qiang Wang (China), Danhong Wang (China), Bulgamaa Batjargal (Mongolia), Jinliang Shan (China), Dapeng Wang (China), Dongfang Hao (China), Chong Wu (China) and Doljin Byambadorj (Mongolia). Back row: Hujun Li (China), Choe Un Hak (DPRK), Choe Kang Mo (DPRK), Hepeng Jia (China), Chen Li (China), David Concar (UK), Bin Zhang (China), Jing Cao (China), Yidong Gong (China), Li Liu (China), Kai Guo (China), Wong Wang (China) and Shujun Wang (China).



Richard Stone, giving a lecture to workshop participants.



Workshop participants carefully listen to the speaker.

## 5. Workshop opening ceremony

The workshop was coordinated by Jiuwu Xu of CSSTJ and Hepeng Jia of SciDev.Net. It opened with a message of welcome sent from Zhonghua Ye, dean of GUCAS. Ye stressed that GUCAS is paying great importance to science communication training and has launched China's first MSc in science communication. Ye hoped that the workshop would provide an enriching experience not only for participating trainees but also the teachers and graduate students of GUCAS.

Mr. Y. Aoshima, director of the UNESCO Beijing Office and UNESCO's Representative to China, DPRK, Japan, Mongolia and Republic of Korea. Aoshima said that human beings have been communicating scientific knowledge since the earliest of Man's discoveries, such as the use of fire. Today, in the process of globalisation, scientific knowledge spreads to the wider public primarily through various media channels. But there is still a long way to go before we reach a satisfactory level of wider (and easier) public access to scientific information.

Aoshima added that complicated, technical and unexciting language is a common barrier to attracting the public to reading about scientific issues. Readers would show more interest in scientific topics and debates if they were presented in an exciting and engaging way. Aoshima wished the workshop great success in training journalists to communicate science in a more vivid way.

Tracy Driscoll, senior communications manager, of the Cultural and Education Section of the British Embassy, (British Council, China), said her organisation was very happy to be supporting this workshop on science communication. She said that over the last five years the British Council has held a number of large scale public exhibitions and events on science, including the DNA 50 exhibition celebrating 50 years since the discovery of DNA by Watson and Crick, the Creative Robotics competition involving Noel Sharkey, the so-called 'godfather' of robotics, and most recently the Zero Carbon City exhibition at the Beijing Planetarium last autumn. Zero Carbon City was also one of the major events of UK-China Partners in Science last year, organised by the British Council and the British Embassy in partnership with the Ministry of Science and

Technology of China, the CAS and the National Natural Science Foundation of China. Tracy hoped that through this workshop, attending journalists would gain new ideas, learn skills and make new contacts that help them better communicate about science with their audiences.

Dong Liu, section chief for urban science popularisation of CAST, said supporting science communication has always been the due responsibility of CAST. In the past years, CAST has performed various activities in spreading science to the public. Science journalists have played a pivotal role in promoting science communication. CAST was supporting this workshop and thanked the international sponsorship and support that made the activity possible. Liu hoped there would be greater cooperation between various parties involved in the workshop in future to jointly push the advances of China's science communication enterprise.

Ying Ding, director of the science popularisation office of CAS highly praised the workshop. She said that no such activity had taken place in China before. Ding said CAS leaders and CAS academics have long been supporting science communication in China and many leading scientists are major players in communicating science to the public. Ding said science communication capacity-building for scientists is also very necessary and that scientists and journalists have complementary roles in communicating science to the public.

## **6. Workshop training: Science journalism skills**

The science journalism training began with participants introducing themselves and their intentions in attending the workshop. The session aimed to encourage the participants to get to know each other and to communicate more freely throughout the workshop.

Participants expressed a desire to know more about science reporting skills and how communication between scientists and journalists can be improved. About half of the participants said they hoped to take this opportunity to exchange views with colleagues from China and abroad. The discussion illustrated the unusual nature of the workshop, and the importance of mutual communication.

### **Introduction to China's science communication and requirements on science journalists**

Shouren Xue began by quoting the famous Francis Bacon saying that knowledge is power, but how powerful the knowledge is depends on the width and depth of its communication. Xue said that the effective dissemination of knowledge about science has been a major problem throughout the history of scientific development. He particularly pointed to the shortcomings in China's science journalism. Science reporting has been too distant from the public's interest; the content too dry, and the style of communication too monotonous, lacking the ability to attract audiences.

Based on his summary of current problems, Xue proposed what he considers the basic qualification of a science journalist — rational scientific thinking. They should not simply report what scientists have done and said, but also help the public to understand its meaning and significance.

"Science includes hundreds of disciplines and specific areas. For a journalist, it is impossible to grasp even a few of all the academic disciplines. Therefore, a science journalist must train himself to have the capacity to talk with scientists whose areas they are not familiar with," Xue said.

Xue stressed there is no fixed formula that will enable science journalists to achieve high-quality reports. They must prepare for interviews through background reading in advance, taking accurate notes, summarising interviews carefully, and repeatedly checking for accuracy with either their interviewees or other scientists in the same field.

Finally, Xue admitted that the professional science newspapers in China have poor revenues and little awareness of potential markets, while the more market-oriented media often lack truly important science reporting due to the lack of attention given by commercial newspaper editors. He said that the larger problem

of poor public interest in science reporting may not be solved by addressing editors and reporters alone, but may increase if editors and reporters improve their skills.

### How to find science news

Stone was the major speaker for the lecture. He began by outlining the five criteria for a good news story:

- fascination value;
- size of natural audience;
- importance;
- reliability of the results; and
- timeliness.

Referring to the fascination value, Stone compared the discoveries of a dinosaur skeleton and the first primitive insect. Although the scientific value might be the same, the rarity of the insect fossil makes it more likely to be considered a fascinating event.

The term 'size of natural audience' represents the degree to which the public are concerned by the scientific discoveries or event. Often, reports on viruses able to infect humans or animals attract a greater audience than those about pure academic findings in laboratories.

Concerning importance, Stone introduced recent papers published by *Science* magazine. The importance of a discovery often lies in the fact that it can potentially influence millions of lives. Mentioning reliability of results, Stone suggested that journalists should not always believe too much what they hear from individual scientists and that journalists have to conduct their own investigation.

Stone then highlighted various sources of science news, including:

- embargoed press releases from journals like *Science*, *Nature*, *Cell*, and *Journal of the American Medical Association*;
- conference presentations;
- enterprise reporting;
- visits to laboratories;
- journalistic investigations; and
- profiles of scientists.

Stone recalled his recent experience in writing and editing news stories for *Science* magazine. In the case of the eruption of Mount Etna in July 2001, Stone recalled that he first heard about renewed eruptions on 26 July, and then called around to volcanologists that day and the next day to find out which research groups were at the scene and what kinds of scientific questions they were asking. He fortunately spoke with Clive Oppenheimer of the University of Cambridge, United Kingdom, who pointed to his colleagues on Sicily. In this case, Stone stressed the importance of relying on the network of scientists to explore news angles.

In another case, Stone gave another example of how to find interesting science news. In the summer of 2000, he was skimming through a book of abstracts from an obscure environmental conference held in Russia the previous year and he suddenly found an intriguing paper abstract. It described a neurological disorder in eastern Siberia. Two words leapt out, 'spreading' and 'fatal'. He noticed, then, that the research team had instant credibility, as it included scientists from the U.S. National Institutes of Health. He made contact with the researchers, and slowly began to put together the story of a disease called 'bokhoror', or 'the stiffness'. It is known in the West as Viliuisk encephalomyelitis, or VE.

After the initial research, Stone confirmed that disease had spread dramatically over past several decades and he also identified some mysteries, as it appears to afflict only indigenous peoples, not caucasian-Russians.

After the initial investigation, Stone flew to Siberia to report the case. Using this example, Stone reiterated how to explore science stories' fascination value, follow the size of the natural audience and check the reliability of the results.

He also mentioned his experience in reporting Tsunami-afflicted Sri Lanka, plutonium pollution in the former Soviet Union's atom bomb test centre in Kazakhstan, and the efforts by scientists in the DPRK to seek international cooperation.

While highly welcoming Stone's speech, journalist trainees also shared with Stone their difficulties. One trainee asked about the privileges that Stone has as an editor for *Science*, such as the green light to visit many places, access to the most prominent scientists and to internal information.

Stone answered that although he did enjoy some privileges, these should be considered not as such but as the characteristics of certain types of media. He said although he was allowed to visit DPRK for reporting on international science cooperation, he did not obtain the visa again when the DPRK government invited an international media group to report on a new industrial park.

Julie Clayton distinguished between different types of sources for science news stories: shared sources and exclusive ones – where one reporter gets the story before others.

As examples of shared sources, she listed some major science news sources such as EurekAlert!, Google news alerts, and Global Health Reporting, as well as press conferences and press releases from many other sources such as government departments, non-government organisations and scientific conferences. [6] [7] [8] Julie then focused her talk on exclusive ones. She ranked conversation, leaked news by scientists or science officials, local events, and conference presentations reported by only one journalist, as major sources for exclusive reporting. To understand the key information, Julie recommended that journalists get to know some scientists who can advise them on judging the novelty and significance of a particular scientific development. Like Richard Stone, Julie outlined important criteria for a good science story, including:

- novelty;
- immediacy;
- relevance;
- impact;
- trends; and
- human interest.

While it is important to try to grasp the important information during initial conversations with scientists, equally important is to make follow-up interviews, which include both seeking ideas from independent third parties and validating them with the previous interviewees. The third-party views are crucial in judging the credibility, importance, and shortcoming of earlier statements. But it is also very necessary to present criticisms raised by other scientists to the key scientist of the story.

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[6] EurekAlert. <http://www.eurekalert.org/>

[7] Google News Alert. <http://www.google.com/alerts>

[8] Global Health Reporting. <http://www.globalhealthreporting.org/>

## How to write science news and features

Richard began by referring to his own experiences in reporting the Tsunami aftermath in Sri Lanka and the collapse of Angkor Watt in Cambodia.

In Sri Lanka, his assignment was to report and write a second-day news feature with a scientific angle, on the aftermath of the south-Asian tsunami. After investigation, he decided to report on the success of aid workers in preventing a mass disease outbreak despite the tsunami-ravaged settlements along the coast of the country. Even with this good angle, Stone reminded journalist trainees to hook the readers in the first paragraph. Readers, he said, sympathise with personal tragedy. Bring the reader to the scene. Then, reporters should vary the pace in telling their stories and let their sources do the talking.

Stone suggested journalists should not always assume the reader is with them, and that they should keep the readers' attention by offering another personal story. Finally, he recommended ending the story by returning to the experiences of a central character.

In the other of his stories, 'The End of Angkor', Stone defined his angle as the collapse of a great medieval city suggesting that environmental miscalculations can spell doom for even the most highly engineered urban landscapes. In the lead of this story, Stone also used the technique of bringing the reader to the scene and he described the scene of an Australian research team in Angkor. His leading paragraphs read:

"Cambodia — Crouching in the bottom of a gully, Roland Fletcher traces with his finger the beveled edge of a pitted, grayish-red rock. The carved laterite block with a sloping face fits snugly in a groove in the block below. "It's a fancy piece of work," says Fletcher, an archaeologist at the University of Sydney, Australia. Centuries ago, the people of Angkor built immense sandstone palaces and temples on foundations of laterite, a spongy, iron-laden soil that hardens when exposed to air. In excavations begun last year, Fletcher's team discovered that the half-meter-long block is just one piece of a dilapidated platform extending 20 meters underground in either direction. The platform appears to be the remnants of a massive spillway, possibly used to disperse floodwaters unleashed by monsoon rains. "Nobody had ever seen a structure of this kind here before," Fletcher says."

He discussed, in particular, the use of the words and terms highlighted in the article.

Despite being descriptive in his news feature, Stone warned about the risk of devoting too much space to describing the scene. Only when there is enough space, and when the length of the article does not scare readers away, can reporters indulge in their writing so freely.

Following Stone's lecture, workshop participants raised many questions. One asked how the scientific aspects of a story can be balanced with descriptions of the scene and quotes. Another commented that Stone's technique might be difficult for short stories in newspapers. Stone said science would always be difficult to tell accurately and simply, and reporters have to always consider the interests and patience of their readers. To the second question, Stone said the technique might be more appropriate for feature writing, but its principle of always engaging the readers in the writing process works for short stories too.

Julie Clayton followed on from Stone's lecture by organising group discussions for participating journalists. Participants shared with each other their experiences in interviewing and reporting, and the lessons learned. Each group was asked to nominate one representative to report the discussions to the rest of the workshop. The proposal received a warm response from participants.

Typical examples given by the participants included one case by Danhong Wang of *Science Times*. She said that Tsinghua University once organised an activity to invite five Nobel laureates to celebrate the 80th birthday of C. Y. Yang. But journalists invited to the event rushed to interview the five Nobel laureates and

the situation became difficult to control. As a result, the host drove away all journalists. The next day, Wang published a comment in her newspaper, saying that the host of the event had organised the activity very poorly and had then blamed journalists. Luckily, Tsinghua apologised for the action to drive out the journalists. The case, she said, illustrated the importance of there being a mutual understanding between journalists and the agencies being interviewed.

Another example was given by Yidong Gong of *China Features*, who also writes for *Science* magazine. Gong reported an alleged paper fabrication by Sichuan University's professor Xiaoqing Qiu. At first Qiu refused to respond to Gong's request for an interview. But then, before Gong finished his article, he phoned Qiu's assistant again to ask for clarification. This time, Qiu unexpectedly granted an interview and gave his explanation against the fabrication allegation. Gong said it was important that journalists check the truth of their assertions, even if this is very difficult. There will always be unexpected benefits from doing so.

Julie Clayton summarised the experiences of journalist participants at end of the section. She said that the experience and lessons of Chinese journalists are common to other journalists worldwide. The lessons learned included the importance of maintaining a long-term relationship with scientists, increase mutual communication with interviewees, and learn more about the background to a situation.

### Science feature writing

Before beginning the lecture, Concar asked journalists to write three points which they thought were crucial for a good feature. Nearly all trainees suggested lively descriptions and clear clues as the most important characteristics.

Then Concar gave what he considered to be the challenges for a good science features:

- if telling the story over 2000 words or more, it is easy to lose reader;
- more research is needed to generate the critical mass of a feature — facts alone are not enough;
- the need to define scope and boundaries;
- the need to storyboard material;
- the need to map out a structure; and
- the need to bring more to the writing than core facts.

Meanwhile, Concar also said for a good feature, being a good writer is not enough, and the role of the editor is crucial. Writers should always work with good editors, they should pay great importance to structure and have good story telling technique. Concar said that science features cover various themes, such as basic science, lifestyle issues, current affairs, and investigative versions of previous reports.

For sources of feature stories, Concar suggested writers look out for daily news, current affairs in news, science behind the news, scientific meetings, new science books, social trends and government policies. Even a casual talk with friends may bring an inspiration for a good science feature. When writing a science feature, writers should try to picture their readers, have a clear sense of their story's beginning, middle and end, and identify the links between the story and the culture or society.

Finally, Concar gave an example of how he wrote a controversial science feature, referring to one of his features for *New Scientist* about the effect of ecstasy on human brains. It has long been considered that a chemical called MDMA in the drug would harm the brain of users. But research indicated that there might not be the necessary evidence, and that brain scans of people supposed to have been harmed by MDMA may be flawed. Concar said this was an interesting but highly risky report, because it could give the impression that drugs such as ecstasy were harmless.

Based on these considerations, Concar and his colleagues carefully dealt with the material. While revealing some of the previous research on the dangers of MDMA might be flawed, they always tried to stress that

ecstasy addictions can harm in other ways. They tried to provide the message that the reporting of flawed science makes it harder to educate young people about genuine dangers.

Julie Clayton then completed the session by showing participants the differences between a news story and a feature inspired by the same event: the admission by cloning expert Professor Ian Wilmut that he was not the only scientist responsible for Dolly — the famous cloned sheep. The development was both a front page news story and a page six feature in the UK newspaper *The Guardian*. Julie highlighted that the news story contained just the essential facts of the story, including the “5 W’s and H” of a news story: the what, why, when, where, who and how, whereas the feature explored the issues behind the news story — that of the teamwork involved in scientific progress and the different people affected by the failure of Wilmut to acknowledge his co-workers more openly and publicly before now.

### **Selling stories to the editor**

In this final session on journalism skill training, Julie began by posing the question to journalists: “What do you want to write about?” She recommended to the participants that they find an area that they find interesting in order to have the energy and patience to research and investigate a story. She outlined the many different types of science news and features that a journalist can produce, such as new discoveries, new technology, science policy, science funding, politics, science behind news, ethics of research, and profiles of scientists.

Then she reminded writers to be aware of which editors and publications they would like to write for. For example, she reminded participants that if they write for SciDev.Net their articles can then be reproduced in their local publication. For example, during a recent workshop held by SciDev.Net in Cameroon on the reporting of malaria research, participants attended a conference on malaria research, and one of the participants, Bennen Buma Gana reported daily for his radio station. He then also followed up a SciDev.Net news story on research into how malaria affects pregnant women who are at the same time infected with HIV. He has since continued reporting for SciDev.Net.

Julie outlined the different audiences and types of science news stories covered by different publications. She compared SciDev.Net’s focus on developing countries with the broadly international but more scientifically focused readership of the scientific magazines *Nature* and *Science*.

Journalists writing for daily newspapers in particular face a considerable challenge when trying to sell their stories to the editors. These include: beating the competition with other stories from the worlds of politics, business, the arts, health and lifestyle.

Julie asked participants to divide into four groups to consider what obstacles they currently face or have faced in the past when trying to sell a science story to an editor. Each group then presented examples to the rest of the workshop. Tony Shan of the *Beijing Mirror* spoke on behalf of one group, saying that many problems were highlighted during their discussions. These included poor communication between young journalists and their editors – particularly those who are excessively critical about writing style. A possible solution put forward would be to bypass a middle editor and go straight to senior editors. Other participants noted, however, that this could damage the relationship with immediate editors, and that it was more important to improve these relations. Tony also highlighted the difficulties faced by journalists on weekly publications for whom deadlines may clash with the reporting of scientific developments announced on other days. Other issues included the importance of finding a new angle on an ongoing development — such as a recent scandal in China over the price rise of drugs given new names.

The second group, presented by Lin Lan of Beijing TV, recommended science reporting as a good excuse for covering sensitive areas that editors are sometimes afraid to cover, such as transgender individuals. He successfully gained approval from senior editors to produce a TV documentary on people who have had sex changes. His group recommended that the readers’ interests be reflected in a science news story and the importance of good communication with editors.

Yidong Gong of *China Features*, described his difficulties with an editor and how a story on animal welfare was prohibited because of a clash of interest – the story was due to appear at the same time as domestically farmed birds were being slaughtered to prevent the spread of bird flu.

Julie summarised the obstacles faced by participants and recommended ways in which journalists could overcome some of these. These included avoiding the boredom factor among editors by finding fresh angles, getting fresh sources, making success stories rather than doom and gloom (for example when writing about a topic such as HIV/AIDS), linking stories about scientific research to topical events such as international events.

Furthermore, the placing of the story in a newspaper, should the editor take it, will depend on the angle a journalist uses in their story and how it relates to other areas of public interest such as politics and business. The story may appear anyway from the front page, or a middle section on home or international news, to a specialist science page, depending on the topic and angle.

Julie also mentioned two other hurdles in science reporting - a writer's fear of being able to understand the issues and technical language of science, and their lack of communication with editors.

Finally, Julie said she would be happy to recommend the participating journalists to leading science journals she has written for, such as *New Scientist*, *Nature*, and SciDev.Net.

### **How to distinguish between real and false science**

Fang Zhouzi has experience of investigating pseudoscience in China. In the beginning of his lecture, he gave three famous examples of such cases.

The first was Zhang Yingqing, a former Shandong University professor who claims to have invented holographic biology. The second was Jiang Chunxuan, a retired space engineer who claims to have proven mathematical conundrums such as the Goldbach Conjecture and Fermat's Last Theorem and also denies the Riemann Hypothesis. The final case one is of Xu Yelin, who said he invented a non-bias diode which could utilise limitless energies in the air. Each person received fame and high media exposure as a result of their claims.

According to Zhang Yingqing's so-called holographic biology, each region of an embryo has its own corresponding region in the whole organism, and the shape and size of an organism's organs – such as the leaf of a tree, or a human hand – are related to the species' overall size and structure. The theory was applied in fields including acupuncture, agriculture and cloning. Zhang became a millionaire and famous academic with his inventions until 1995, when several famous scientists accused Zhang of pseudoscience. Shandong University stopped the courses he taught and withdrew funding. The resulting stress and poverty led to Zhang's early death in late 2004.

In the 1980s, former CAS president Fang Yi asked its Institute of Mathematics to evaluate Jiang's research, and professional mathematicians delivered a unanimous verdict that it was flawed. Jiang's papers could not be published in domestic journals. But he received a favour from a former US physicist R.M Santilli, who published several papers by Jiang in his journal *Algebras, Groups and Geometries*. Jiang also claimed his paper used to be published on international famous journals like *Mathematical Review* and *Zentralblatt Math*.

In Xu Yelin's case, he did publish some papers in non-physics journals such as *Missile and Aviation Technology* in China and his work had obtained invention patents of China, Russia, the UK and the United States. In 2002, the local government of Sichuan applied for US\$5 million funding from the central government's National Development and Reform Commission to commercialise Xu's invention.

Fang said when reporting such stories, the background of the researchers should be checked. In modern sciences, it becomes more and more difficult for non-professional background people to develop important inventions. Yet in these three cases, one did not have a bachelor degree, and the other two have bachelor degrees outside the areas in which they claimed to make their scientific breakthroughs.

Journalists would also need to research the commercial interests of the people in question. If potentially they would obtain big profits, they are very likely to have an intention to exaggerate their findings. In the cases of Zhang and Xu, both could earn millions of dollars if their inventions were commercialised.

Then, most importantly, Fang reminded journalists to take notice of where the findings are published. Publishing papers in normal, peer-reviewed journals in the academic fields should be considered as a normal channel and the most important criteria to judge their values, as they have been assessed by leading researchers in the science community. Other channels for publicising work include:

- News conferences or media interviews without having published papers first — Fang said it is very difficult for journalists to judge the importance and truth of an invention and journalistic judgment should be aided by the professional scientific community.
- Academic evaluation meetings and hearings — certain evaluators or scientists could be bribed to favouring others research work.
- Newspapers and book publication — these are not verified by the independent professional science community.
- On-site exhibitions — these can be arranged in advance to fabricate results Only in strict laboratory conditions in which other interfering conditions are excluded, can experimental results be believed.
- Patent authorisation — this is a highly misleading technique. If patents are not accompanied by rigorous academic papers in professional journals they should not be quoted as the basis for judging real science.
- International fame and awards — could be obtained by bribing awarding agencies and some could even be invented by the scientists themselves. For example, Zhang used to organise an international society of holographic biology and became its president. The society then gave Zhang numerous awards.
- Conference reports — the quality of which could not be guaranteed and the submission process of reports at an academic conference is far less rigorous than an academic journal.

After his lecture, Fang discussed these criteria with the journalists. When asked "How do we know the journal publication is truer than other channels?", Fang replied that the peer-review system has its flaws, but it is the accepted 'best practice' to ensure results are worthy and correct. There have been some institutional designs to prevent corruption and nepotism, such as anonymous peer review and the challenge system. Like other rules, this practice is likely to be poorly operated, but compared with others is reliable.

He was also asked how to judge results where there are two opposing groups of scientists discussing the validity of results. Fang reminded the participants to research into the scientist's background and look for conflicts of interests that may suggest a particular bias in their viewpoint.

## **7. Workshop training: Internet skills**

### **How to evaluate the quality and credibility of website information**

Julie demonstrated how to find valuable and credible information in Internet. She used the example of a malaria research project and its significance to China. First using Google News, she searched with the terms 'malaria' and 'China', and found a recent announcement about the launch of a new research project that

involved an international collaboration between researchers in the UK, China, and elsewhere. [9] She then typed the lead researcher mentioned to find his affiliation and contact details. After that, Julie searched for further information on the scientist's background and collaborations in the PubMed database which provides details of scientific publications. [10] Julie recommended these steps a way to find email addresses for scientists in order to request a telephone or email interview. Julie then demonstrated, again using PubMed, how to find Chinese researchers working in the field of malaria research who could provide independent comment on the importance of new developments.

Then, Julie listed additional sources for science news such as EurekAlert!, SciDev.Net and the Health and Media Partnership. [11] [12] [13]

In terms of free access, SciDev.Net has a special arrangement with the journals *Science* and *Nature* to link to selected key papers in order to provide free access for readers.

Conferences are also a great source of scientific information, for example, the Fourth MIM Pan-African Malaria Conference. [14] Conference abstracts are sometimes available on the web. Julie urged journalists to frequently visit the website of important conferences to get updated information, and contact the organisers to request abstracts.

After Julie's lecture, participating journalists exchanged their own sources and their views on using the Internet. They said that although in China and East Asia there are not authoritative enough science news services such as EurekAlert! there are still many resources to utilise. After this discussion, they suggested the a number of websites might help them to finding science news:

The website of the CAS links to all its institutes and journalists can find a lot of updated information. [15] Also, the China Science and Technology Information website is operated by the Institute of Science and Technology Information under the Ministry of Science and Technology. [16] It is updated daily and its sources include the Institute of Science and Technology Information Network across China and often posts information not mentioned by other sources. In addition, the website has free access to a batch of science policy and management articles published in journals belonging to the Institute of Science and Technology Information.

For academic conference information, the China Academic Meeting website is a useful site. [17] This website offers not only conference and meeting information not only in China, but across the world. It offers online registration services and links to the event organisers.

The Mongolian Development Gateway offers various development and science information and news. [18]

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[9] Google News. <http://news.google.com/>

[10] Pubmed Central. <http://www.pubmedcentral.nih.gov/>

[11] EurekAlert! <http://www.eurekalert.org/>

[12] The Science and Development Network (SciDev.Net) news. <http://www.scidev.net/news/>

[13] The Health and Media Partnership. <http://www.healthandmedia.org/>

[14] The Fourth MIM Pan-African Malaria Conference. <http://www.mim.su.se/>

[15] The Chinese Academy of Sciences. <http://www.cas.ac.cn/>

[16] China Science and Technology Information. <http://www.chinainfo.gov.cn/>

[17] The China Academic Meeting website. <http://www.meeting.edu.cn/>

[18] The Mongolian Development Gateway. <http://www.gateway.mn/>  
<http://www.gateway.mn/index.php?newlang=english> (English)

Julie provided participants with useful criteria on how to judge the quality of a website, and highlighted some individually, these included:

- **Purpose**  
Does the website have a mission statement, or a statement indicating the intended audience, services or information? How concise and accurate is the statement?
- **Audience**  
Is there an explicit statement about the target audience? Do aspects such as language, professional skills, reading level, graphics or design indicate the target audience? Is the intended audience specific or general? Is the audience defined by gender, age, race, religion, special interest, health status, occupation or geographical location?
- **Interactivity**  
How easy is it to navigate around the website from one section to another? How logical is the organisation of the website? What is the visual balance - of words, icons, pictures, and colours? Do the visual elements help to draw attention to content? How innovative and original is the website design and function? Does the website have any exceptional features?
- **Appeal**  
Is the website aesthetically pleasing?
- **Accuracy and credibility**  
How factually detailed is the information? Beware of content that goes against well-accepted beliefs without proper discussion. This could be an indication that the information may not be accurate or credible. Note content omissions — are the limitations of information clearly stated? Are references provided indicating the source of information, including statistics? Is the information based on scientific research? When information relates to clinical trials, remember that randomised clinical trials are generally accepted as being the most definitive, followed by other study methods such as non-randomised trials, and case/cohort studies. Information based purely on case reports and subjective statements are the least accurate. Is there a potential conflict of interest for the provider of medical information? How often is content updated — weekly, monthly, within 6 months, or a year?
- **Access**  
Does the website require subscription or other steps to be taken before viewing content?
- **Specialty**  
Is information categorised according to different potential users whose specialisation varies?
- **Sponsor/affiliations**
- **Privacy**

## 8. Workshop training: Dialogues with scientists

In this part of the workshop, five lectures were given, covering water science, science policy system, science ethics, environmental science reporting, and reporting disasters and any relevant science issues.

### Key science issues in water sector and their relevance to reporting

Yangui Wang first briefed the major achievements in water science and related projects in China. However, he said the country's quick economic development, together with overuse of water resources, low utilisation rate and serious harm to the environment have become major problems in China. The health of rivers in China is also serious, including flooding, water shortage, the deterioration of water quality, erosion and river shrinkage.

The basic water problem facing China is the imbalanced location of water resources. Resources in areas south to the Yangtze river account for 80 per cent of China's total water reserve, but the land in these areas only accounts for 30 per cent. Every year, more than 7 million hectares of land is afflicted by serious drought

and 400 of the 669 cities have water supply difficulties. In addition, under the influence of climate change, the river runoff in northern China has reduced by 10 per cent.

In 2003, a total of 68 billion tons of sewage was let in China, polluting 70 per cent of China's rivers.

In addition, the water utilisation rate is low in China. The average water utilisation rates for both agriculture and industry are just 50 per cent of developed countries. Unreasonable human development of land, mines and deforestation has increased erosion and water losses.

Wang outlined some major potential problems in water project developments, including the migration issues they caused, their influence to erosion and watercourse, their impact on the atmosphere, human heritage, fish and other wildlife, the influence of water body changes, and possible geological disasters such as land slides, and the most serious one, the collapse of large dams.

As examples, Wang analysed two major water projects in China, the Three Gorge Project and South-North Water Diversion Project. According to Wang, each of these two projects have met most of the above problems when being planned and they have been discussed and researched repeatedly by scientists as well as social science researchers. But he admitted that there is still little public participation in researching the feasibility of water projects.

Journalists asked Wang whether certain types of problems quoted by him, such as water project's impacts on the environment and ecology, have in fact influenced policymaking. Journalists also asked about other projects, such as the controversial dam on the Tiger-Leap Gorge. One journalist also extended the question to climate change and how climate change might influence river runoff?

Finally, Wang suggested that before journalists report on such water projects, especially controversial ones, they could first consider to seek viewpoints of some authoritative water experts and use their answers to judge the scientific facts.

### **The operation, management and evaluation of China's science system**

This lecture was designed to make journalists understand the basic operation of China's science funding and base their reflections on the sound facts. This has been particularly important as many criticised the current science funding system for curbing innovation.

First tracing the history of China's science management and operation system, Zhu said the process was implanted from Western countries with long-term aim to improve China's scientific ability.

Zhu said from the very beginning, there are two systems of state funding for science. One is the UK and US model, in which there is no strong central research and funding agency. Another model was initiated by France and continued by Russia to establish a large state academy. China has naturally this route.

As a result, concentrating scientific and financial resources into certain areas through the government has promoted the fast development of science, especially in some major scientific breakthroughs, such as the atom bomb and satellite developments.

But certainly the model has its shortcomings. The research institutes are only responsible for the administrative, and not the industrial, departments of the government. There is not a fair system to commercialise scientific research, which is often considered as a public asset. Science research agencies lack autonomy and there are huge wastages of scientific resources.

He then discussed the reform process of China's science management and funding system. The changes affect the administrative order-based research, the autonomy of research institutes, funding allocation, and the indirect project funding system for which scientists can apply. Meanwhile, more and more social funds,

including those from private sector and from state-owned enterprises, have been adding to the total research and development budget of China.

Zhu's lecture led to a heated discussion, focusing on the disputed corruption and low efficiency in science funding. Zhu answered the inquiries by saying that although the direct administrative allotment system has been replaced by peer review-based funding system, the voices of scientists are still too weak in the funding decision process and the administrative officials are still able to decide who should receive the money. They can do this by organising the evaluation meeting and inviting their favoured evaluators. Meanwhile, the lack of public monitoring and supervision in research funding, and the lack of transparency in research programme organisations all lead to the abuse of research money.

### **Science ethics and its relevance to journalists**

Hu started his lecture by distinguishing science ethics from scientific scandals, such as the fabrication of their inventions or corruption of science funding. Ironically, he said when South Korean stem cell scientist Hwang Woo-suk was accused of unethically using eggs donated by his fellow female researchers for research; it did not receive a lot of notice. Hwang's scandal became world's famous when it was revealed he fabricated experimental data.

He cited the case of human cloning/stem cells to discuss the difficult issue of science ethics. From the scientific view, cloning technologies bring great benefits to humans. But in the area of research ethics, there are difficulties: how to balance the rights of the embryo from which the stem cells are extracted and the rights of adults benefited from the stem cells?

Although there are opposing views on science ethics, Hu suggested journalists look at two principles as their starting points: the first is the non-harm principle, which means no matter how beneficial research could be, it should not harm any other person; the second one is the equal distribution principle, which means every participant in the research process, no matter if they are scientists or research subjects, should have equal rights and enjoy the equal results.

In order to determine the ethical issues concerning scientific research, Hu suggested that there should be a consultation system. This system should first exist within the scientific community between scientists of different disciplines. Consultation should also exist between scientists and the public through the media. In addition, procedural justice is very important in judging scientific ethics. For example, ethical review boards cannot be dispensable for any clinical trial. Due to the imbalance in terms of knowledge, the two sides of the dialogue between scientists and the public, scientists should have greater responsibility. They should first prove their research is harmless.

There were active discussions after Hu's lecture. Journalists mainly put forward three kinds of questions. First, how to ensure public consultation in science research? It is often very difficult to persuade scientists to join the dialogue. Secondly, even among the science community, an atmosphere of debate has been lacking. Third, most journalists are not equipped to challenge scientists in research ethics questions.

Hu said rules should be introduced to force scientists to participate in the public debate, such as institutionalised public hearings. The media can always promote the process by closely following topics involving the ethics of science. Regarding the lack of debate in the scientific community, Hu said this might be because of the Chinese culture, but with more public participation, the debate within the scientific community could be ignited. Thirdly, although journalists have poor knowledge, they can always offset this by seeking more authoritative experts' opinions. But it is also warned that the controversy concerning scientific ethics should be based on the sound science instead of the agendas of some NGOs.

## Science journalism and the environment

Zhang started his lecture by introducing the mission of his organisation, US Environmental Defence. It is mainly involved in the emissions trading mechanism. The mechanism allows polluting enterprises to sell their emissions quota if they dramatically improve their waste processing capacities. It also permits polluting enterprises to buy emissions quotas from polluting enterprises if they felt the effort to reduce their own emissions could be too costly than buying from others. The mechanism has seen good results in the United States.

Then, Zhang compared science communication on emissions trading and the reports of an environmental accident taking place last year in the Old Summer Palace in Beijing, China. When reporting emissions trading, the media learnt the scientific aspects gradually. Since 1999, several media workshops on emissions trading have been held and media reports of the project have been mostly positive.

But the environmental case at the Old Summer Palace was different. At first, an environmental expert found the park management laid an impermeable membrane in the lake bottom to prevent water losses. The large water costs were a financial burden to the park, which had not received substantial funding. But this method risked impacting the ecology of lakes, such as damaging the lake's micro-organisms. Then experts exposed the case to a newspaper. After the newspaper, the *People's Daily*, reported the case, there has been huge media interest in the case, most reproaching the action.

Yet all the time, the park authorities did not stand up to defend themselves, causing more media attention. Many environmental NGOs were involved in the case to question the practice, and several public hearings were held to decide whether the impermeable membrane should have been laid used. Media reporting became unanimously opposed to the impermeable membrane. But later, after an environmental evaluation by experts from Tsinghua University, it was concluded that if the impermeable membrane laying could be well designed to leave enough holes, this could still be done.

In this case, Zhang pointed out that the reluctance of the park authorities to face the media and the public, the involvement of many NGOs, as well as people's questioning of the environmental authorities' role, have led the media debate off the track of the scientific issues. Often the environmental NGOs have very loud voices, regardless of whether their voices are scientifically sound. Zhang also indicated that the real situation is often more complicated than the scientific issue. For example, the Old Summer Palace park did not defend itself positively because it was suspected to be involved in corruption. The cost for it to lay down the membrane was several times of the market price.

From this case, journalist trainees held warm discussions. One journalist pointed out that for grassroots NGOs and activists in China, to have influence is more important than seeking scientific truth, because only with this dominance, can they obtain the public attention. Another journalist questioned that the first reporter did not fully consult with scientists on the membrane case but still obtained an environmental defender award.

Finally, participants of the workshop agreed that when reporting environmental controversies, they should not only report science, but also consider other factors that might influence the final development of cases.

## Natural disasters and science reporting

Ren began his lecture by analysing the characteristics of natural disasters. He said the damages caused by natural disasters are always a result of both natural and social conditions, such as the emergency reaction capability. In modern times, with the concentration of populations in urban centres, the damage caused by natural disasters could be much bigger than in ancient times.

In the case of earthquakes, Ren said three major factors are most crucial in related news reporting, such as the time, place and the size of the earthquake in question.

Then he analysed some newspaper reports. Ren first considered a Xinhua report on an earthquake in Jiujiang, Jiangxi Province in November 2005. The news reported three factors within two hours of the earthquake, so it is timely work. Then he further analysed other reporting concerning the Jiujiang earthquake. In one news story, he found it reported that the local government launched the emergency prevention programme within half an hour.

Ren then looked at a news story on the relationship between the Three Gorge Project and the Jiujiang earthquake. There was rumour that the earthquake was related to the Three Gorge Dam, but a local official, who used to be a geologist, dismissed the link by saying that the dam was on a different geological plate to that of Jiujiang. While confirming the importance of refuting the rumour, Ren said that the fact that the news based its conclusion on a former geologist was unsound. Also, in another report, the local official talked about the efforts to predict earthquake. Ren said scientifically, there has not been a fully reliable method in predicting the earthquake, and the news story was one-sided by only quoting this official.

He also pointed out the contradictions in reporting disasters. To produce timely reports was the media's responsibility, but this may also bring the risk of causing public panic.

Finally, Ren summarised that for reporters, to properly report natural disasters not only requires them to have sound knowledge, but also needs them to get reliable sources. They should keep their reporting pace with the scientific information released by the emergency authorities, instead of reporting some baseless rumours; even the latter might mean big news.

## 9. Feedback and conclusions

### Feedback

A total of 27 journalists and science communicators were involved in the workshop training. One trainee from the Internet Centre of the CAS was unable to participate in the workshop due to her work schedule, another from the newspaper *Science Times* attended as an audit and also contributed to the feedback. Twenty-five feedback forms were completed; each participant gave marks out of 10 to gauge their responses to a set of statements about the workshop. The results are shown in the table below.

Statement	Number of responses	Average mark (out of 10)
The lectures and course material were well prepared	25	8.5
The instructors communicated clearly and effectively.	25	7.9
The instructors have motivated us to learn more about the subject	25	8.5
The facilities available for the conduct of the course were good	25	8.4
I gained a good understanding of the concepts/principles in this field	25	8
The topics chosen for the course were relevant and useful	25	8.6
The practical exercises were sufficient	25	7.6
The instructors appear to have thorough knowledge of the subject	24	8.5
The coordinators were friendly and helpful	25	9.4
Hospitality, including boarding and lodging, was good	23	9
Overall, the organisation of the course was good	25	8.7
Interaction among the other participants to develop further collaboration	25	7.8
Do you recommend that the course be conducted in future	25	All Yes

Table detailing the results from the workshop feedback session

### Individual comments

"I hope to get more cases about science communication." Li, Jian, from *China Youth Daily*

"More professional, experienced reporters from China and abroad should be invited, such as *China Youth Daily*, *Washington Post* and the *Guardian*. People can work together on the same news." Shan, Jinliang, *I Mirror*

"The courses helped to extend my understanding of scientific knowledge and enhance my capacity to handle scientific reporting." Cao, Jing, *Weekend Pictorial*

"The courses are reasonable. The only regret is my English can only roughly follow the process in English and the translators are not very professional and sometimes other trainees behaved as translators. If high-quality translation could be offered, it would be better." Wang, Dapeng, *Beijing Morning Post*

"I wish to get more time to discuss the subject in the future." Huang, Jianhua, *Beijing Youth Daily*

"I hope there are more lectures on TV media." Wang, Qiang, Tianjin TV

"I hope the courses will last longer." Li, Chen, *Science Times*

"I would be better if more scientists are invited to give more recent and controversial topics. Better too, if we had more discussion time, we had some, but I think we could have had more." Wu, Chong, *China Daily*

"Please invite more scientists to give us lectures on what they think most worthwhile in science for reporting."  
Hao, Dongfang, *Mass Science & Technology Daily* and CAST

## Conclusions

Based on our discussions with trainees and the results of the feedback session, the workshop was successful in providing practical journalism skill training and encouraging direct communication between journalists and scientists, and active exchanges between science journalists.

Despite the positive response, we are aware that we might not have done enough. We have learned that many trainees thought there was not enough practical work involved. In fact, previous SciDev.Net workshops have done well in this aspect, but our Beijing workshop was a little different, as it is very broad in contents and time was scarce. It was also because our partner, GUCAS, as an education agency, preferred more teaching time.

We had originally hoped to arrange more dialogue between lecturing scientists and journalist trainees, but in practice, this is hard to achieve, because most lecturers were accustomed to talking more about themselves and hearing less from the listeners. Although coordinators had tried to guide the lectures toward discussions, they often found the lecturing scientists were not happy to follow their suggestions. In a larger sense, this is typical of China's scientific environment, in which scientists do not discuss issues even within academic circles.

Another fault was that the workshop was an international one with trainers, lecturers and trainees coming from foreign countries. Together with language barriers, participant also differed in their knowledge backgrounds, interests, and expectations to the workshop.

We believe more things could have been done to overcome these shortages. One solution is for future workshops, the scope will be made narrower, so that people have more common interests and concerns. Another solution would be to include journalist's contributions regarding their own work and their experiences from previous workshops.

Finally, all workshop participants were encouraged to write for SciDev.Net, *Nature*, *Science* and *New Scientist* as freelancers. So far there is little contribution from Chinese and Mongolian freelancers to these journals, and if some of the workshop participants could become freelancers, there would be a community of journalists from the region.

Regarding translation, we did not hire any professional translator due to budget constraints. High-quality professional translators are expensive in China. However, we have recorded all the lectures and discussions in the workshop and will gradually collect them for the workshop participants to review the workshop lectures.

## Appendix

### List of participants

Name	Employer	Position	Location
Liu, Li	<i>S&amp;T Daily</i>	Reporter	Beijing, China
Shan, Jinliang	<i>Beijing Mirror</i>	Reporter	Beijing, China
Huang, Chaowu	<i>Farmer's Daily</i>	Reporter	Beijing, China
Li, Hujun	<i>Nanfang Weekend</i>	Reporter	Beijing, China
Zhang, Bin	<i>Liberation Daily</i>	Reporter	Shanghai, China
Wang, Dapeng	<i>Beijing Morning Post</i>	Reporter	Beijing, China
Huang, Jianhua	<i>Beijing Youth Daily</i>	Reporter	Beijing, China
Lan, Lin	Beijing TV	Editor	Beijing, China
Hao, Dongfang	<i>Popular Science News</i>	Reporter	Beijing, China
Li, Chen	<i>Science Times</i>	Reporter	Beijing, China
Zhao, Yixia	Info Centre, CAS	Editor	Beijing, China
Wu, Chong	<i>China Daily</i>	Reporter	Beijing, China
Wang, Yong	<i>China Info</i>	Editor	Beijing, China
Cao, Jing	<i>Weekend Pictorial</i>	Reporter/editor	Guangzhou, China
Wang, Shujun	<i>People's Daily</i>	Reporter/editor	Beijing, China
Guo Kai	Radio ChinaInternational	Editor	Beijing, China
Wang, Qiang	Tianjin TV	Editor	Tianjin, China
Gong, Yidong	China Features, Xinhua	Reporter	Beijing, China
Li, Jian	<i>China Youth Daily</i>	Reporter	Beijing, China
Li, Huibin	CCTV	Reporter	Beijing, China
Choe, Yong Il	Central News Agency	Editor	Pyongyang, DPRK
Choe, Kang Mo	Central News Agency	Reporter	Pyongyang, DPRK
Hong, Yong-II	State Academy	Official	Pyongyang, DPRK
Choe, Un Hak	State Academy	Engineer	Pyongyang, DPRK
Batjargal, Bulgamaa	UB POST	Reporter	Ulanbataar, Mongolia
Byambadorj, Doljin	Mongolia DevelopmentGateway	Reporter/editor	Ulanbataar, Mongolia

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