

The Centre for Industry Education Collaboration – A Global View

In 2018-19, Dr. Guirong Wang, from Beijing University of Chemical Technology, spent a year with CIEC. This article explores the innovative work of CIEC from her viewpoint*



Guirong with children celebrating their Children Challenging Industry (CCI) success in Cambridge

Why did you choose to visit CIEC for a year?

I met Sir John Holman in November 2017 when he visited Beijing – he was attending an academic event as the President of the Royal Society of Chemistry. He told me about the world-class outreach work that CIEC has been doing for thirty years, explaining that they have combined the design of effective practical programmes with research and evaluation of impact. I did some further research and realised that there was nothing like this elsewhere in the world.

I have always been impressed with the outreach work done in the UK, which has the longest history in the

world, going back to the Michael Faraday Christmas lecture of 1825! In recent years, the Chinese government has begun to recognise the importance of outreach both for primary and secondary school students and for the general public.

In 2016, my home university, Beijing University of Chemical Technology (BUCT), set up the BUCT Outreach Centre, both to promote the development of science outreach and to collaborate with other organisations. Working with my Beijing supervisor, Professor David G. Evans, over the past three years, we have taken part in many national and local science festivals, and organised demonstrations and hands-on experiments for students.

Our activities are very popular, but we wanted to evaluate the activities and do further research on outreach, and we needed some help. That's why I decided to come to the UK and spend a year with CIEC, where I am being co-supervised by Sir John Holman and CIEC's Director, Joy Parvin.

Can you tell us a little about the flagship Children Challenging Industry (CCI) programme that you have observed?

In the first a few months of my visit, I became familiar with the publications that have been developed and used in the CCI programme, and observed

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different aspects, including the delivery of lessons in primary schools, science staff meetings for teachers and the training of scientists and engineers who work in industry to work effectively with primary school children. I also accompanied some classes on their site visits to science-related companies, which is clearly the highlight of the programme for many children. I realised that all these sessions are based on careful evaluation and research over many years, which ensures the effectiveness of this programme.

What do you think are the benefits for the children who take part in Children Challenging Industry?

In the CCI programme, children learn science in a real-life context, improving their motivation and enjoyment of science. When I took part in the classroom sessions and site visits, I could see the excitement on their faces. However, I think what's more important and will have a long-lasting influence on children is that the programme helps to develop their awareness of what they can do in the future and why they need to learn science: great career guidance for children of this age.

I have noticed that teachers benefit from the programme too. They receive training from CIEC specialist teachers at staff meetings and work alongside them delivering two lessons linking science from industry to the primary science curriculum. Teachers also accompany their classes on the site visit and interact with a variety of STEM ambassadors trained by CIEC. All this leads to teachers being a lot more confident in their own ability to deliver effective and relevant science lessons – this continues to benefit the children even after the CCI programme is finished.

How are the publications used in the Children Challenging Industry programme developed?

I was delighted to be able to observe the development of a new primary

science publication, based on sustainability, which was co-ordinated by one of the CIEC team, Nicky Waller. The process began with a workshop contributed to by members of the CIEC team and members of the Department's Green Chemistry Centre of Excellence, with input from chemists and engineers working for Thomas Swan, Johnson Matthey, Quorn, Croda and Ineos. Nicky and Joy [Parvin] used the contributions at this event to draft an exciting new publication combining information about sustainability with engaging practical activities and links with the primary school curriculum.

How does the work of CIEC interface with other educational initiatives?

John and Joy have offered me many opportunities to learn about other organisations and projects in the UK that collaborate closely with CIEC. For example, I met the Primary Science Quality Mark (PSQM) Director, Jane Turner. CIEC has been involved with PSQM since its inception. During my visit, CIEC ran a pilot project with PSQM schools, funded by the Royal Society of Chemistry. This project aimed to use the expertise developed through CCI to support PSQM schools to have greater impact on the aspirations of primary children. It achieved this by brokering links between STEM ambassadors and teachers and training them to make the most of the collaboration.

What has impressed you most about CIEC?

People working in CIEC are really enthusiastic and passionate about what they are doing – they are very effective and collaborate with each other very well. The CCI programme has now been running for 25 years and has fostered many connections with primary schools and industries to benefit large numbers of children and teachers. Each session of the programme is designed very carefully and every detail considered to a very high standard. CIEC evaluate their programmes using questionnaires and

interviews with children and teachers. This makes CCI very systematic, both practically and theoretically – this cannot be done without determination and persistence. That's the most impressive part about CIEC.

What have you taken back to China based on your experience with the team?

I have delivered some elements of the CCI programme since I returned to China. It is not exactly the same, because of differences in the culture, context and education systems. I am currently working with Nanjing Publishing Group and CIEC to begin our first major pilot of CCI in Nanjing! As the CIEC team has developed remote training opportunities for companies and schools during the pandemic, we hope to utilise this model. We hope to start with 5-6 primary schools and one company, after adapting two of CIEC's publications: *Water for Industry* and *Potatoes to Plastics*. I think that the link with industry is really important and special.

I have seen that companies in the UK become very involved in organising the children's visit. They take their social responsibility extremely seriously, and I believe that this will contribute significantly to the next generation. In China, some industries are also keen to help improve science education. I hope to start the pilot by working with one bio-plastics company and hope too that this experience will provide insight and guidance for other outreach programmes in China. I have been inspired by my work with CIEC and feel very lucky to work with them. I hope that we will establish more collaborations on science outreach in the future, which will benefit a lot more children, especially in China.

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