BRITISH COUNCIL

British Council China Higher Education Partnership Fund (2018-2024)

University of Brighton fires intelligent manufacturing research with unique transnational education partnership

How can remanufacturing and its related disciplines of intelligent manufacturing and extending the circular economy harness academic research to help deliver more effective and sustainable global manufacturing processes?

Academics and industry leaders have long seen the potential of international higher education exchanges to disseminate industry's remanufacturing knowledge and best practices while broadening research and education opportunities for students, academics, and researchers. However, such visionary academic partnerships require more practical pathways and innovative funding, if they are to succeed in the longer term.

The British Council China Higher Education Partnership Fund has provided just the innovative support academics and industry need to transnational academic initiatives to help find answers to this era-defining challenge.

Global collaboration

Drawing on the UK and China's remanufacturing heritage – such as the China-UK Remanufacturing Summits that bring together universities and industry partners for collaboration, the funding led to the BRI Education Partnership in Intelligent Manufacturing (BRIIM) project, a partnership led by University of Brighton, in collaboration with Wuhan University of Science and Technology (WUST), Chongqing University (CQU) and Malaysia University of Science and Technology. The initiative focused on promoting collaboration in intelligent manufacturing between the UK, China, and Malaysia with a particular emphasis on remanufacturing and addressing mutual challenges while building sustainable partnerships.

In line with the British Council's collaboration vision, the partnership team quickly built a strategic plan comprising the development of trans-national higher education projects for enhanced graduate employability, fostering entrepreneurialism, and the internationalisation of higher education around remanufacturing. **Key objectives included enhanced student mobility and academic exchanges, building academic leadership skills and capacity in participating faculties, and creating robust and frameworks for lasting partner research collaborations.**

Programme leaders took an innovative approach to meeting these objectives and ensuring value for money: they jointly designed and developed a core curriculum, created an enabling environment for transnational collaboration, regular student exchange programmes between partner faculties and, crucially, given pandemic travel restrictions in 2020-22, focused on the remote learning-based delivery of leadership training and professional development capacity for partner universities' departments.

Yan Wang, Principal Lecturer, at University of Brighton's School of Architecture, Technology and Engineering and the Advanced Engineering Centre, emphasised the partnership's commitment in the face of Covid and travel constraints:

> "Partner universities were wholly committed to success. Although we weren't able to meet face to face during the pandemic, we quickly developed a plan, communications channels, and online learning platforms to collaborate together remotely."

Key programme activities

The partners' determination, and remote collaboration led to exciting collaborations in multiple areas, including academic exchanges, next-stage funding, and conferences.

Academic exchange and collaborations

As pandemic restrictions were eased, the programme has created regular faculty visits and between the three partners, to facilitate research collaborations, knowledge sharing and face to face discussion. To build partner faculties' teaching capacity, the programme leadership team also designed the leadership and teaching programmes at partner faculties using state-of-the-art online learning platforms and outcomes-focused assessments. **The partners also planned new undergraduate and postgraduate remanufacturing courses at the University of Brighton.**

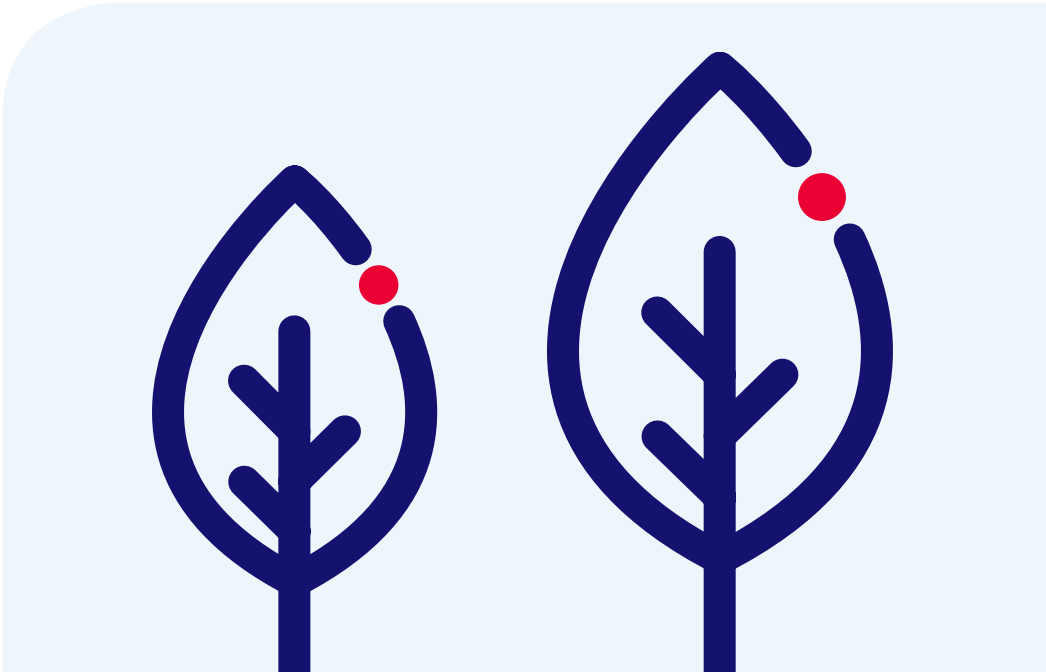
Dynamic fundraising

The partners created a next-stage funding plan and successfully leveraged in wider financial support to extend research into remanufacturing totalling **£1.2 million**, including University of Brighton's researchers gaining **£500,000** funding to explore ways to make manufacturing more sustainable and cost-conscious.

Conferences and events

The partnership was instrumental in organising a high-profile China UK Remanufacturing Summit in London in May 2019. Hosted by the UK Government's Department for International Trade and Department for Business, Energy, and Industrial Strategy (BEIS), 70 programme and external stakeholders attended the summit. The programme partners developed a research into the UK's intelligent manufacturing and remanufacturing trends including a national survey of **44 companies** followed by the publication of position paper, ***A Study of the Potential of VRPs for Resource Efficiency***, which evaluates current UK progress in these areas and serves as a guide for governments' future policy interventions in this area.

The programme maintained momentum for remanufacturing knowledge-sharing by organising a China-UK Green Low Carbon and Remanufacturing Industry Development Conference, held in Cangzhou on July 24th, 2023. Part-sponsored by the British Council China, this time more than **180 academics**, students and stakeholders from China, the UK, Malaysia, and other countries attended, while a British Council China representative made a keynote address at the event.



The BRIIM partnership's game-changing outcomes

The partners' determination, and remote collaboration led to exciting collaborations in multiple areas, including academic exchanges, next-stage funding, and conferences.

- **Academic mobility and research**

The BRIIM partnership's exchange programme alone has enabled 20 UK academics and students to visit to China, 50 visitors from China to come to the UK and supported 20 visitors from China to attend the 2023 International Conference on Remanufacturing and colocated Rematec exhibition. Separately, the programme has funded five student exchanges, mainly at postgraduate level.

The partnership has supported a wealth of joint research initiatives and established joint laboratory capabilities. Partner universities have already co-authored and published 20 different research papers, alongside making two successful research grant applications and an additional research proposal.

- **Academic training**

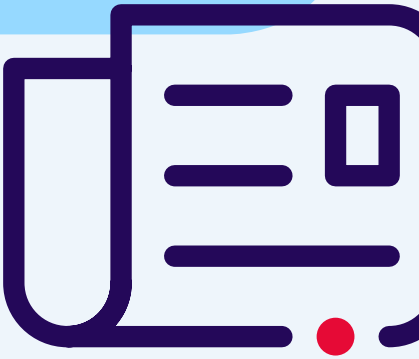
The collaboration has delivered game-changing teacher training in the partners' faculties. These have included training for more than 30 engineers, three PhD students, two knowledge transfer partnership associates, five research officers and ten additional master's level research projects. These breakthroughs are being achieved through the considered use of online learning platforms and rigorous assessment approaches across the participating universities.

- **Trans-national education initiatives**

Informed by joint workshops in Chongqing and Wuhan and supported by the successful adoption of remote learning systems, the programme has resulted in the curriculum redesign of the mechanical courses introducing more intelligent manufacturing and circular economy contents in the courses to meet industrial needs for automation and sustainability at the University of Brighton. This has contributed to the five-year accreditation from Institution of Engineering and Technology and Institution of Mechanical Engineering for the course (2025-2030).

- **Industry and academic stakeholder outreach**

The British Council China Higher Education Partnership Fund has enabled partners to unlock funding sources to support a vigorous stakeholder outreach programme, targeting more than 1500 key stakeholders, with knowledge shared through a blend of workshops, presentations, and webinars. The British Council China Higher Education Partnership Fund partially funded the 2023 International Conference on Remanufacturing (ICoR), in Amsterdam in June 2023, in conjunction with Rematec, the world's leading organiser of remanufacturing trade exhibitions.



Lasting commitment

Programme lead Yan Wang at University of Brighton, says: "The British Council have been extremely friendly and responsive to our different requests. As a result, we have built a successful project based on an effective and highly collaborative partnership between the three universities."

Professor Jiang Zhigang from the Wuhan University of Science and Technology, highlights the depth of partnerships achieved: "The project funding has been really helpful in enabling my team to work with colleagues in Brighton and the other universities. It's led to a very fruitful collaboration, developing academic publications, staff exchanges and joint research programmes."

Professor He Yan from Chongqing University emphasises the programme's learnings, commenting: "This funding is instrumental in my collaborations with UK colleagues, especially during Covid. And my research students learned a lot from the interaction with the UK teams."

A bright future for intelligent manufacturing research

The British Council China Higher Education Partnership Fund has helped deliver a remarkable programme of transnational research collaborations, exchanges, and events benefiting the partner universities. The programme outreach has engaged and nurtured an international audience of **1500** academic and industry leaders in remanufacturing, intelligent manufacturing. The programme is notable, not only for partner universities' resourcefulness in designing alternative online teaching and learning resources but also for the entrepreneurial use of the funding to secure further grants to support further research and further stakeholder events.

Programme leader, Yan Wang at the University of Brighton, says the funding has had a huge impact on academics' remanufacturing research, at both an individual and collective level:

"The British Council China's funding has been instrumental in my setting up the partnership and it has made a significant change to my own career; it's enabled me to engage stakeholders from forward-looking academic colleagues in different countries to co-develop an effective collaboration agenda, deliver teaching excellence and set up ground-breaking research programmes."

She anticipates that further collaborations will spring from the partnership. "We will continue to collaborate with each other in terms of joint teaching, research events, mobility and engagement of policy-makers."

BRITISH COUNCIL

British Council China Higher Education Partnership Fund (2018-2024)

University of Brighton

Project title

BRI Education Partnership in Intelligent Manufacturing (2019-2024)

Project introduction

University of Brighton joined hands with universities in China and Malaysia to advance education and research collaboration in Intelligent Manufacturing. Focused on remanufacturing, the project sought to develop curricula, foster joint research and engage stakeholders in sustainable manufacturing practices.

Major achievements

- Developed 2 new courses and updated related curriculum at UoB
- Trained students, researchers and industry professionals through collaborative activities
- Secured significant research funding for circular manufacturing
- Influenced policy making on remanufacturing standards

Project in numbers

2 courses developed with curriculum updates for

100+ students annually

70+ visits between UK and China

30+ joint publications and £1.2m research grants secured

1,500+ stakeholders engaged through conferences, workshops and webinars

5 PG level student exchanges

2 major international conferences

&

2 high-profile China-UK Remanufacturing Summits

Key innovative aspects

Holistic integration of education, research and policy in Intelligent Manufacturing

Addressed challenges through stakeholder debates and workshops

Key takeaway

Cross-border collaboration in education and research requires meticulous planning and a deep understanding of differing regulations. Strong partnerships and early alignment are crucial for long-term success.

'This funding is instrumental for me to work with colleagues from the UK, especially during Covid. My research students learned a lot from the interaction with the UK teams.'
-- Prof. He Yan, Chongqing University