

Good morning everyone.

My paper today is really a news item. It's an update on a paper I presented in Blacksburgh two years ago. Back then I was talking about the Engineering Exchange as project we were planning to enhance community engagement with engineering research. Today is an opportunity for me to update you on how things have gone in the first two years and to start to reflect on what this means in the wider context of engineering and philosophy.

In the next twenty minutes I will tell you a bit about what the Engineering Exchange is, why it was established, what it is that we do, and then discuss with you some thoughts about critical and theoretical reflections on our practice. We've been busy just doing this work, and I'd like to invite all of you to help us to think critically about what it means and how we could improve our practice.

The Engineering Exchange was set up to improve engineering engagement with local community groups in London. We justify this in terms of balancing our engagement with the outside world. As engineering researchers we have a lot of incentives to work with industry partners. We are increasingly encouraged to engage with policy makers, and the engineering exchange addresses that third leg of democratic society, the communities who are directly affected by engineering and technical decisions. We work on a model of two way engagement, providing access to technical knowledge and listening to communities to shape our future research. Our core work is funded by the university, and we have had funding from the Royal Academy of Engineering to undertake some of our early training and activities.

The idea for the Engineering Exchange really starts here. This is the Carpenters Estate, a social housing estate on the edge of the Olympic Park in London. In 2011 UCL was involved in a proposal to build a new campus on this site. It proved to be quite controversial and didn't go ahead – we are now planning a new campus actually on the Olympic Park – but it was instructive for me to observe how the debate played out on campus. I was struck by how my engineering colleagues discussed the site compare to colleagues in the planning school, geography and other parts of the university. My colleagues would visit the site and come back and talk about what a great opportunity it was, how close it was to the tube station and transport and infrastructure connections, what their new commute to work would be like. Colleagues from geography would come back and talk about what a strong community lived on the estate, what a lovely school they had, how much pride people took in their gardens. The planners and geographers saw people. The engineers saw infrastructure. This was a bit of a shock to me, and wondered if it might be possible to do something to shift this balance. The Engineering Exchange also came from a demand for technical support from local communities. Colleagues from the social sciences and planning could provide some support in urban regeneration and planning, but inevitably there are technical issues that they can't address – like structural integrity of buildings, air pollution monitoring, transport engineering and so on.

So the engineering exchange was set up to expand the vision of engineering and the interests we serve. A lot of engineers really do want to make a difference to their local communities and this provides a mechanism for that to happen. There are lots of reasons why engineers should engage with communities – to support sustainable development, to extend our ethical responsibility to act in the best interests of the public, to enhance innovation by exposure to new problems and perspectives. In the UK as elsewhere we are under increasing pressure to demonstrate the impact of our research on the economy and society, and this provides another mechanism for that.

This is based on a democratic imperative. We live in an increasingly complex technological society. Technical knowledge is used in decision-making every day, and technical decisions have big social

and political implications. Democracy and decision making about technical issues will be improved if a wider range of actors have access to good technical knowledge. This means that we need to do engineering differently. Mike Davis observation that the vast majority of engineers work for large industrial corporations or government institutions is really challenging in this regard, and the Engineering Exchange is in some ways a deliberate attempt to counter balance that tendency. Yesterday Diane Michelfelder talked about post-normal engineering, based on Funtowicz and Ravetz account of post-normal science. As technical complexity and uncertainty increases we need new ways of defining problems and creating knowledge, drawing on wider ranges of expertise and experience. I think the engineering exchange is a response to that and we might be able to characterise what we do as post normal engineering.

So what is it that we do? We effectively provide a match-making service for community groups and engineering researchers. Our model is based on the fairly conservative engineering professional service, between a client and an engineer. We are not a community development organisation, so we only work with fairly well established community groups, who are capable of acting as a client. We agree a project scope including milestones and deliverables, we monitor progress and we sign out projects when they are completed. It's important for us to manage expectations – we only provide fairly limited technical support, we are not an advocacy organisation and we can't address the full range of issues communities might face. We work mostly with researchers – PhD students and above – not usually masters or undergrad students. This is because we need to be clear about the beneficiaries of the work. For students projects, student learning has to be the highest priority. For research or consultancy based projects the community is the main beneficiary.

Our first major project was a review of the evidence for demolition and refurbishment of social housing.