

C5: Reframing and embedding diversity in engineering education

Author: Dr Jan Peters MBE, Director Katalytik and external consultant to UCL Engineering

Arguably being diversity-confident is of greater importance than for other disciplines; engineers solve problems; mostly work in teams, often global; and have the potential to innovate through applying diversity-based critical thinking to create novel products and services. Creating diversity-confident engineers could avoid errors of the past, eg. The lack of a pregnant crash test dummy; the HP webcam software that could track white faces but not black faces; a soap dispenser that wouldn't dispense soap to a black hand and famously the Google photo app that tagged black faces as gorillas. A more embedded approach is required that ensures that both educators and students are diversity confident.

Developed over 6 years of work with the UCL Engineering Faculty and the development of their Integrated Engineering Programme the model for inclusive engineering education provides a robust framework for engineers to consider diversity and inclusion in a way that transcends the view that diversity is political correctness gone mad and can't possibly have any relevance to a circuit board or ball joint.

In the higher education sector, the Athena SWAN Charter and Awards have done much to raise awareness of gender diversity, however engineering departments and schools have barely left first base and many departments – estimated at over half – haven't even left the starting blocks. This model moves the diversity and inclusion conversation beyond representation and embraces an ideological change and defines straightforward evidence based steps for change.

This paper reframes inclusion across four pillars for engineering education: where engineering is taught; how it is taught; what is taught; and the opportunities to practice professional socialisation and identity as an engineer. Building on an HE STEM project lead by the author, the talk will draw on the UCL Integrated Engineering Programme (IEP) where we have worked to embed inclusion within the programme design. Insights will be presented of how the IEP curriculum has addressed inclusion and some results of an assessment tool.

The framework presents educators and leaders of engineering and diversity with an objective way to structure their and inclusion within engineering.