To what extent will the higher education and early careers system deliver the engineer of the future?

Nicholas Povey, 2023

This research aimed to gauge the effectiveness of the higher education and early careers system in delivering the civil or construction engineer of the future. The climate emergency and the rapid pace of technological change in our world are factors that mean a different skill set is required of civil and construction engineers to previous generations. In the UK, the profession requires more engineers annually than what is output from national HEIs today, so the industry not only requires a more diverse set of engineers, but also more of them.

This problem is important because, without effective implementation from the earliest stage of an engineer's education, the skillset of construction engineers will be asynchronous to the needs of society in the future. The industry will continue to lag others in its productivity and innovation performance, and young people will not be drawn to the subject at university.

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The problem was explored via a thematic analysis of 'future vision' engineering publications to determine the main evolutionary points. These future visions were tested for their level of adoption in degree programme curricula and engineering firms via thirty semi-structured interviews across three populations: academics, recent graduates, and managers of recent graduates. The responses from each group were tested against each other to identify gaps in the HEI and early careers system.

The top four future vision themes were found to be: innovation and productivity, diversity and inclusion, net zero, sustainability and decarbonisation, and upskilling re-skilling and lifelong learning. The interview findings suggest that these themes are facilitated well in the workplace both at graduate and manager levels, however in the HEI environment are not meeting the visionary need. There were found to be some occasional specific examples of innovative courses, teaching practices, and engagement exercises, all of which should be considered for adoption by others. HEIs could also benefit from a more robust, consolidated mechanism for understanding industry needs.