



Engineers are fixers. They are driven by identifying, investigating and eradicating problems. Yet the uptake of equality and diversity programmes across engineering has been slow.

If enriching the student experience, closing the achievement gap and maintaining the diversity of your cohort into relevant work is important these five points will help you build creative, engaged and innovative teaching and learning spaces and shape people to produce inclusive engineered solutions.

WHY WE NEED TO CHANGE THE WAY WE APPROACH INCLUSION AND DIVERSITY IN ENGINEERING

All too often on my travels I find that equality, diversity and inclusion (EDI) seem disconnected from the nuts and bolts of engineering and technology.

Teaching has changed considerably in recent times. Inclusion is on the agenda. Awareness of students' needs coupled with withdrawal of funding support has transformed how students can access course material. Often this inclusion is about accessibility. For this read disability. What are we doing about race and gender?

There are few places where inclusion is threaded into course design, content, and delivery as well. And efforts to change the student make-up are limited to outreach efforts.

This Manifesto is shaped to help you explore how to transform the undergraduate experience. Helping students feel like they belong to the community. And have engineers working towards inclusive solutions for all of society and not the few.

Nationally in the UK female students studying engineering make up on average 16% of students compared to only 12% in the professional engineering workforce.

Only 14% of Black, Asian and Minority Ethnic (BAME) students on graduating secure graduate level employment, compared to over 70% of their white counterparts (RAEng, 2014).¹



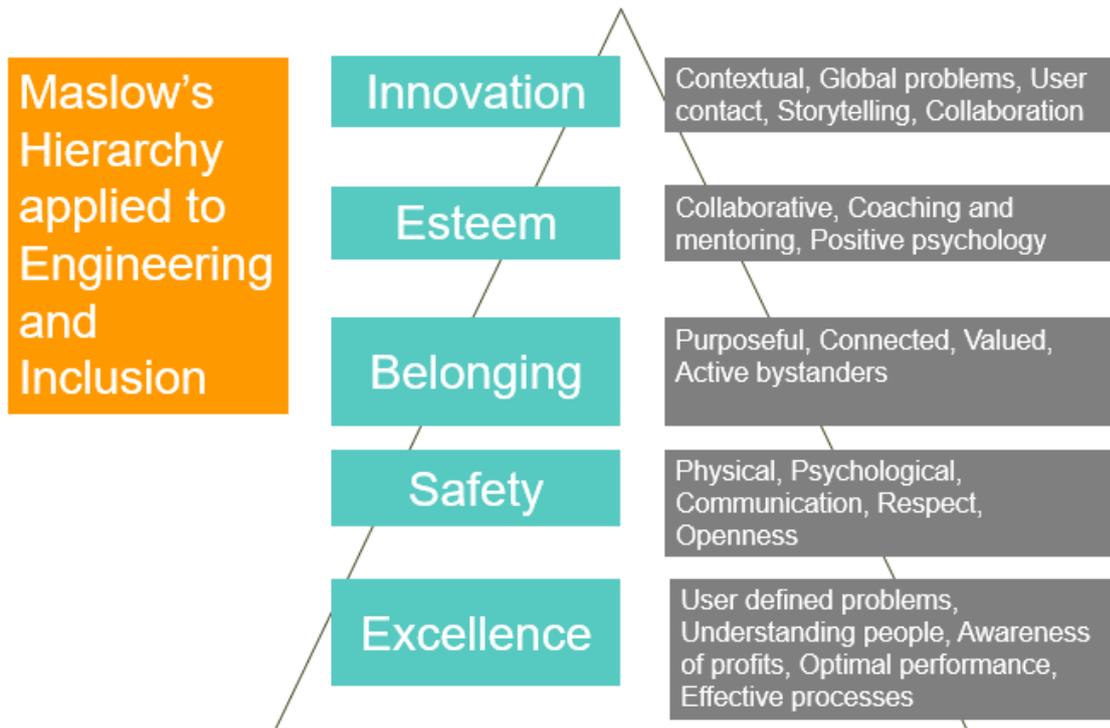
¹ <http://bit.ly/2JVN5OX>

1 EXCELLENT TEACHING, EXCELLENT ENGINEERS, EXCELLENT ENGINEERING

Excellence is what you strive for and get measured on.

What is your peak performance on engineering and its teaching? What is your peak performance on inclusion and how do you measure the student experience? Do you know who your students are and how they learn? Breaking down engineering education and asking how or what can be done to improve the learning outcomes can stimulate thinking and conversations.

Problems, People, Profits, Performance, Processes



2 SAFE PLACE TO WORK AND LEARN

To what extent would everyone on your staff or in your student cohort be able to say they feel safe and can be the best version of themselves, without fear of risk, reproach or ridicule?

How do you monitor and adjust practices to achieve a high standard across all that you do? People in a minority group find they have an added cognitive burden; second guessing what is expected, or safe, to contribute to a project or discussion and is acceptable to the cultural norm of a group.

Set standards for the language you use, a professional approach in communications and clarity on styles and phrases. Know what constitutes illegal communication: verbal threats, racism, hatred and innuendo that would be subject to prosecution² might be level 1. But level 2 will be when a student or tutor feels they can share who they really are at the start, not the end, of a course.

Communication, Respect, Safety, Openness



² Section 127 of the Communications Act 2003
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3 BELONGING

It can be so easy to exclude people unintentionally, not speaking to female students in class and not noticing some contributions. Small, repeated biases that accumulate evident in everyday acts and comments. Subtle and not so subtle shifts convey messages that can increase that sense of belonging.

See [Why is my curriculum white?](#)³

How do we know how people feel unless we ask?

Engineers are stereotyped to be logical, rational and un-emotional beings. Yet, many are not. Those who aren't strive to be and suppress natural tendencies. Those who are need the tools and experience of connecting and checking in with their peers and colleagues. Building bridges, belonging and engagement.

A sense of belonging defines how students interact, can learn about others and get the most from working relationships. Let us adjust our language, thinking and behaviours to purposefully include others. Students and staff from non-majority groups feel they are a valued and useful component of the engineering community. These practices develop good habits and mindsets and help ensure our students are fit for employment by employers that value diversity more and more, such as HS2, BAE Systems and National Grid.



Purposeful, Connected, Valued, Active bystanders

4 ESTEEM AND CAREER CONFIDENCE

In 2019 there's an esteem and confidence gap for minority and women students in engineering compared to white male students. Multicultural and white male dominated courses can isolate students who are more culturally familiar with a collaborative rather than competitive approach. Introverted or sensitive students lose their engineering confidence. The few become fewer as they leave.

Experience, practice, and formative feedback contribute to personal growth. Learning to ask good questions and introducing coaching styles of communication can contribute to professional skill' growth. These build a powerful sense of belief and usefulness within us. When coupled with technical competence this leads to confidence that we are a member of the professional engineering community.

Community of practice, Collaborative, Coaching, Mentoring and Peer coaching and mentoring. Improved self-awareness, and Positive psychology / Appreciative approaches.



³ <https://www.nus.org.uk/en/news/why-is-my-curriculum-white/>
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5 INNOVATION

Combine technical knowledge with inclusive thinking, behaviours and practices. This will provide inclusion-led innovation when engineers: connect with and value human differences; and explore population groups to inform design thinking. A fertile landscape of cross professional interactions, research, and new conversations will contribute to solving the immense challenges facing society. Engineering and design become innovative, driven by inclusion.

Contextual, global problems, User contact, Storytelling, Collaboration

THE PURSUIT OF EXCELLENCE AND INNOVATION.

Excellence and innovative solutions to society's problems. This is why we address equality, diversity and inclusion in engineering. Here at Katalytik we're full of ideas to kick start a conversation and raise your excellence rating.

ABOUT KATALYTIK

At Katalytik we are here to help transform your world.

Since the early 2000's our consultants have been shaping the diversity and inclusion agenda in UK Science, Engineering and Technology (SET).

If you have colleagues who can't get past inclusion as political correctness; who have had equality and diversity 'done to them'; or seem stuck at the representation and data level, maybe it's time to change the conversation. If inclusion seems to be limited to unconscious bias, accessibility of learning materials and role models. We need to talk.

If you can't shift the mix of your student or staff body to make it more diverse, how are you making sure that all those in a minority are having the same quality of learning or working experience as those in a majority? Get in touch.

We offer coaching, consulting and training.

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