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Author	Agg, Chloe;Quazi, Sophia
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Resources for Embedding EDI in Teaching – Processes and Lessons Learnt

Chloe Agg¹ and Sophia Quazi¹

¹Department of Mechanical Engineering, Imperial College London, United Kingdom

c.agg@imperial.ac.uk

Abstract

Marginalised students face less successful outcomes due to systemic biases, yet innovation and sustainability is more successful with diverse design groups. Teaching equality, diversity and inclusion (EDI) may help address this, aligning with the UN sustainability goal of equity. However, few academics in STEM disciplines feel confident and knowledgeable regarding EDI, and are already feel stretched to capacity, making it a challenge to incorporate EDI teaching. Within Mechanical Engineering we have compulsory EDI teaching in years 1-2, and an elective module for years 3-4.

Through Teaching and Learning fund support we have created a website with resources to enable academics, students and industry to embed EDI into their teaching and training, reducing workload and increasing sustainability. These include videos, lesson plans, slide-decks, course handbooks, recommended reading lists and others:

<https://www.imperial.ac.uk/mechanical-engineering/about-us/equality-diversity-inclusion--culture/resources/>

At EESD 2025 a workshop introduced participants to the contents of the website, and our own journeys in EDI teaching. Participants were enabled to create plans to teach EDI, using our resources as well as giving feedback on them. The need for the democratisation of EDI resources to support academic staff in sustainable development of teaching is identified and supported through our project; REET.

1 Introduction

The Resources for Embedding EDI in Teaching (REET) were developed in collaboration with students in order to provide content and simplify the process of integrating EDI in teaching in Higher Education (HE). This paper serves to share current findings of the project and applications of the resources, as well as reporting on the workshop facilitated at the 12th international conference on Engineering Education for Sustainable Development (EESD). As the team have funding until Summer 2026, the paper will also serve to report the current progress of the project and increase awareness of the resources to enhance project impact. Further evaluation will follow when the project concludes.

2 Background

REET emerged from the success of the EDI in Engineering module offered at Mechanical Engineering at Imperial College London (Ojha, et al., 2023). The module is an elective, available to 3rd and 4th year students who are curious about EDI and want to learn more. The time for learning and developing EDI skills for passionate students is ringfenced within the degree rather than treated as an extracurricular activity. This embeds opportunity for student voice and co-creation within the degree programme, giving meaningful value and credit for the input from students, especially those from marginalised groups. The module was developed by 3 students as an outcome of the

undergraduate research opportunity programme (UROP) (Ojha, et al., 2021). This was in response to the resurgence of the Black Lives Matter (BLM) movement after the murder of George Floyd. This prompted these students to examine the issues of representation within the engineering sector. It is well understood that there is a lack of gender and ethnic representation in the engineering sector (Peters, 2018). These students felt that more should be done within the curriculum to address this, and other less well understood elements of minoritisation and disadvantage, and the department agreed. The module was implemented a year after the UROP concluded. The module has been delivered for 3 years now and has been recognised in the Engineering Talent Awards as highly commended in the Inclusion Programme of the Year category (Engineering Talent Awards, 2023).

Some of the EDI challenges which we aim to address via the module and REET include the awarding gap, representation, and the UN Sustainability and Development Goals (SDG), in particular goals 4 (quality education), 5 (gender equality), 10 (reduced inequalities) and 16 (peace, justice and strong institutions). These are long-term problems to solve, and large-scale opportunities to embrace, that require buy-in of EDI initiatives. Cultural shifts can take a while to achieve, but small actions can snowball into greater change, which is what is aimed for with both REET and the module. The success of the module in creating EDI advocates and initiating cultural change led to inquiries from other departments to implement something similar. Increasingly, professional accreditations integrated in degree programmes require EDI. The Engineering Council now requires all UK engineering degrees to include EDI in order to be accredited (Engineering Council, 2020). This also pushed interest and drive for REET to be created.

The UN SDGs are people-centred. People from the most marginalised backgrounds face greater impacts from climate change, (Sawas, 2025). The impacts do not affect only one group, meaning intersectionality needs to be considered. This is not a problem only for the Global South but also for the Global North. Black working-class women were impacted the most by the devastation of Hurricane Katerina in New Orleans, (Sawas, 2025). A nuanced understanding of EDI needs to be held to combat these deep systemic issues, which multiply the impacts of climate disaster. Additionally, great teamwork is required that includes people of diverse perspectives to ensure the nuances of these large, complex problems are accounted for. REET aims to incorporate the foundations of EDI into existing curricula.

3 Barriers to EDI in Teaching

Despite the great amount of interest in this module, there have been barriers to expanding the module further than the authors' department. The main ones are time and workload. Workloads are high for academics in the HE sector (Morrish, 2019) and there is careful thought and consideration needed in order to add a module to a curriculum. Though efforts are being made sector wide to address this, REET aims to make it as easy as possible for a wide variety of staff to incorporate into the curriculum.

Another barrier is staff confidence in teaching EDI related subject matter. The authors' home institution is a STEM organisation so many staff and students have not experienced social science and they might have hesitancy or reluctance to teach subject matter they are not confident in. We often think about the development of students and the need to scaffold their learning as they grow their ability to undertake activities independently, as has been laid out by Vygotsky's Zones of Proximal Development (1978), however, little thought is given to providing similar support for staff embarking on new methods or topics. To provide this scaffolding, all of the REET videos have an expert for each topic, and they are accompanied by lesson plans. This aims to take care of the time and learning required for starting from scratch.

In addition to the challenges listed above for staff buy-in, it is equally important for students to engage with EDI. Though the module was received well, it is optional and for a self-selecting group

of students who are already interested in the subject matter. Another aim of REET through the project being student-led means the subject matter selected is appealing to the student population. For example, the group work video will resonate with students who are required to take team projects and hopefully offer meaningful advice to prevent and manage conflict within a team. Sector-wide, microaggressions against marginalised students are common in groupwork settings.

4 Founding of REET

With many people interested in the EDI in Engineering module, but staff not having the capacity to develop EDI content themselves, we decided we wanted to make our existing resources freely available to people. This initially was being done as people came to us to ask about the module, but this was time consuming for all involved, and gave a very low distribution rate; it was not sustainable. The authors' home institution has funding associated with the Learning and Teaching Strategy for which staff can apply on a regular basis. In December 2023, having been running the EDI module for 1 year and 1 term, we applied for the *Excellence Fund for Learning and Teaching Innovation* (Imperial College London, 2024). At this time, the funding was tied into the Racial Equality Charter (REC), a UK based benchmark for universities to monitor and improve HE experience and outcomes for both staff and students (AdvanceHE, 2024). As our intention was to create and distribute EDI resources, this association was beneficial as it aligned with our aims, thus increasing our likelihood of success in the funding bid. It also provided a focus for the work, as EDI is a large area, focusing on racial equality provided a starting point.

Specifically, the funding required all projects to address one or both of the following points of the College's 2021 REC action plan;

“Action 3.2: Create anti-racism training materials for students.

Action 3.3: To work with students to ensure that curriculum and assessment are fully inclusive of ethnicity.”

(Imperial College London, 2021, pp. 10-11)

The resources we we're sharing, and aimed to create, would meet action 3.2 and our approach, covered below, would meet action 3.3. As such, the two authors, who are also the co-leads of the EDI module, collaboratively put together a funding bid and were successful in obtaining £36,000 including buy-out of staff time.

In parallel to the main REET project, as part of providing funding, the university asked the authors to provide a workshop for staff who had been unsuccessful in applying for the same funding we were receiving, where this staff had requested funding to create EDI teaching. This workshop, whilst beneficial to the attendees in developing future funding applications, was also beneficial to us as providers. Understanding the needs of staff interested in starting or expanding their EDI teaching informed how we ran the project and changed our focus from the EDI in Engineering module specifically to our broader EDI teaching such as Active Bystander, Unconscious Bias, Allyship and Inclusive Teamworking.

5 Methods

When doing EDI work it is essential to include multiple voices. This perspective is echoed through co-creation approaches within HE, with the need for marginalised groups to be empowered through student-staff partnerships in pedagogic development (Cook-Sather, 2018). This co-creation approach was also a requirement of the funding; action 3.3. Many HE Institutions (HEIs) across the globe have summer research projects available for undergraduate students, these are generally referred to as

UROPs. In addition to standard UROPS, the authors' institution has a subset of educational focused projects for internal students only, known as StudentShapers (Imperial College London, 2025). The REET project made strong use of the StudentShapers system to facilitate co-creation and the amplification of marginalised voices, especially those from racially minoritised backgrounds.

We advertised the StudentShapers project across all College departments, receiving 9 applications, and appointing 5 students, as per our funding availability. All students were from the global majority, with backgrounds ranging over at least 3 continents, they represented 2 Faculties and 3 different departments. Each student was employed for 2 weeks to work with the authors with the remit to:

- Identify topics they personally connected to relating to EDI in HE
- Research these areas for correlations with racial equality and belonging
- Identify relevant topic experts to interview on camera
- Develop the interview questions
- Develop lesson plans to educate other students about the topic, making use of the final video produced from interviewing the expert

By working with students we were able to get a student perspective on learning and teaching, as well as lived experience of the barriers encountered by racially marginalised students in our setting. Additionally, by having students who had educated themselves about the EDI topics interview experienced experts the videos we created are both relatable to other students, informative due to the expertise, but also engaging due to the dynamic interaction between the two parties. Similarly the lesson plans co-created by the students and ourselves benefitted from the input of student voice to make it engaging for current cohorts, but also our own input of pedagogic and sociological expertise.

The project topics selected by the students, and refined in collaboration with ourselves, were:

- The impact of socio-economic status on educational quality – Uzer Mughal
- Embedding EDI values into team based learning and group projects – Ayushi Gupta
- Microaggressions towards women in STEM – Yixin Zou
- Underrepresentation of ethnic minority women in academia – Fatima Nasir
- Bias and implicit discrimination towards East Asians in the workplace – Lingwen Du

To further empower our students, we set up media training with an external provider so that our students were confident speaking in front of the camera, engaging with the experts and creating an engaging narrative for their interview. The StudentShaper projects though was only step one of the project, with the whole timeline being represented in Figure 1:



Figure 1- REET Timeline from launch to time of writing

As can be seen from this diagram, additionally to recruiting the StudentShapers, we also recruited admin support for 3 months over the initial summer period of the project. We elected to recruit a graduating student as our part-time administrator to create further opportunities for the amplification of the student voice within the project. The administrator reviewed all existing EDI teaching resources created by the paper authors to ensure that they were in accessible formats, that personal information was removed, and that copyright rules were appropriately followed. The administrator also underwent website editor training provided by the university, and then built the REET website, including uploading all the existing resources. The administrator also played a role in ensuring collaboration

between all parties, creating template documents, sharing good practice and coordinating meetings between stakeholders.

Whilst the original intent was to record and edit the videos over the summer, it was not possible to coordinate all parties at this time, and filming was postponed to the Autumn term. This pushed back availability of videos into 2025 and as such roll out has taken place at events over spring and summer of this year.

6 Reflections and Positionality

The Engineering Academic perspective – I have 8 years experience working in HE, and around a decade of industry experience preceding that. As a mechanical engineer working in industry I also ran the office graduate scheme, leading me to join academia where I have had ever increasing opportunities to do EDI work, which is where my heart lies. However, I acknowledge the privilege I have, holding the role of Student Experience Champion, which gives me time and resource to be able to take action on EDI within my department. I also have the privilege to work in a department who had already decided they wanted to run an EDI in Engineering module before I even joined, allowing me to walk into the development and running of the module. Few others have these opportunities, and are overloaded with standard teaching, assessment, admin and research, which is why EDI can be hard to embed. This is why I feel it is important for me to use my privilege to create and share these resources; EDI should not be gatekept. My experience of doing so has been enjoyable through working with the students, but at times frustrating; such as trying to coordinate many different parties. I have learnt a lot about EDI through this work, as well as about the lived experience of others, and my own values and perspectives. Thus I would encourage others to embark on this rewarding journey of development, whilst making the world more equitable.

The EDI Coordinator perspective – I have 7 years of experience working in EDI and 10 years working in HE. I have a strong social science background with my highest level degree being an MSc in Criminology and Criminal Justice. Having worked in HE for a decade in London-based Russell Group universities, I have a solid understanding of the complexity of large universities and their different moving parts. The previous organisation I worked for was the London School of Economics and Political Science. This meant I arrived at my current institution with a strong social science background, which is different to all of the engineers I work with. Working here was an initial culture shock with the difference in subject matter, but it meant I could offer an alternative perspective within the department.

Working at my current institution for almost 4 years and working on this project, there is an observation I have that I hope can be expanded through a wide implementation of REET. Staff and students can have a rudimentary understanding of EDI, where they know the Equality Act 2010 exists and that there are protected characteristics. The most obvious ones to them are sex, race, disability and sexual orientation. Most will understand sustainability but think of it more numerically in terms of the reduction of carbon emissions. I feel there are many staff and students who do not see these things as connected as they are. I recall the first year of implementing the EDI in Engineering module and the lecture on race and racism. Our guest lecturer connected the impact of coloniality and how this impacts thinking towards sustainability goals. All students were highly engaged, and I could see so many students experience a lightbulb moment because they had not considered how interconnected all of these issues are. Through REET, I would like more lightbulb moments for all staff and students.

7 Workshop Learnings

During EESD a workshop was run to share the REET materials, but also to support colleagues in develop a plan for how to make use of them in their settings. The background to the project was presented, as per this paper, the website and resources were reviewed, as well as the authors' own experiences, what barriers had been experienced and how these were overcome. Participants were then provided with a worksheet, to facilitate consideration of using the resources. The worksheet questions, which we would encourage readers of this paper to similarly consider, are:

- What EDI related issues within the academic journey are you trying to address?
 - e.g. gender discrimination in teams...
- What year groups (and/or modules) do you want to address?
 - e.g. 3rd year design projects...
- When during the academic year/degree cycle should this take place, and how?
 - e.g. Start of 3rd year. Use REET video/lesson plan on embedding EDI values in teams...
- What are the challenges and/or logistical barriers? How will you mitigate these?
 - e.g. design tutor buy-in, arrange a group coffee catch-up to share ideas...

Whilst discussing the resources with the workshop group, and developing participant plans for embedding them, the authors received feedback from the participants and formed observations based on the discussion, our collective findings were that:

- REET and the materials created and compiled lean towards an undergraduate focus. This was made clear as one of the workshop attendees inquired about applications of REET to a postgraduate audience. This makes sense considering all the student collaborators for this project were undergraduates. Whilst we are aware of people adapting them for use for a postgraduate taught course content, this can be a point to explore for further developments.
- Staff training is included in the resources, but this too has a focus on teaching undergraduates. REET content about inclusive supervision for PhD students has not been developed and this can be an area of expansion.
- We have received a lot of interest in this project, but still experience low attendance for some events. As stated previously, time and high workloads are a major challenge for academic and teaching staff. However, despite the small number of attendees, engagement at the workshop and similar events is always high. To address this, we aim to make REET intuitive and user-friendly. We know our colleagues in the sector lack time but are not lacking enthusiasm.

8 Conclusions

Our experience in EDI within HE has led us to see that we are all working towards similar goals, and constantly reinventing the wheel is unproductive. In some cases, this reinvention is due to the paywalls of publishing, and in other cases this is because the EDI practitioners would not be paid if their content were freely available. In either case, barriers exist to those wishing to embed new EDI content. To sustainably create inclusive environments we must democratise this information. Anecdotally, we are met with sighs of relief when colleagues within our institution find out these resources exist through REET, and that they do not have to start from scratch. If EDI work is not adequately resourced and available for free, we add to the workload of our already burdened colleagues to try and fit EDI in their teaching. Furthermore, colleagues who are not engaged with EDI will use that as an excuse to not even try.

Building on this reinforced enthusiasm, we will continue to advertise and roll out resources for use in the academic year 2025/26. We would like a wide variety of colleagues to use them and provide their feedback through our online form to inform the evaluation phase of our project. We want to continue expanding and improving REET. We see this as critical in an environment where free and open access is being defunded, as can be seen by the National Teaching Repository ceasing to accept submissions from June 2025 due to lack of funding (Irving-Bell, 2022).

We therefore invite all readers to access and use the REET website and materials, and hope that it brings you relief, as well as bringing equality, diversity and inclusion sustainably into your classroom.

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