Imperial College London

Sep 2023

CREATING A MODULE TO EMPOWER ENGINEERING STUDENTS TO BECOME CHAMPIONS FOR EQUALITY, DIVERSITY AND INCLUSION

E&PDE 2023 Conference

Pallavi OJHA, Asad RAJA, Angela SUN
Chloe AGG, Julie VARLEY and Linda STRINGER

Imperial College London

Who are we?

Pallavi Ojha

Semper Fire Engineering
Fire Engineer, 2023

Cambridge Medical Robotics
Mechanical Engineer, 2022-2023

Imperial College London
MEng Mechanical Engineering, 2018-2022

Asad Raja

Dyson Technologies Ltd
Senior Data Analyst, 2023

Dyson Technologies Ltd
Mechanical Engineer, 2021-2023

Imperial College London
MEng Mechanical Engineering, 2017-2021

Angela Sun

Encode Club
Programme Manager, 2023

DCA Design Consultancy
Mechanical Engineer, 2020-2021

Imperial College London
MEng Mechanical Engineering with a Year in Industry, 2017-2022

Chloe Agg

Imperial College London
Student Experience Champion

- Equality, Diversity & Inclusion in Engineering Module Lead
- Engineering Design Lecturer

The University of Warwick
Senior Teaching Fellow, 2017-2022

10+ Years in industry

Imperial College London

Black Lives Matter and The College Response

- May 27 2020: Protests break out in Minneapolis after the murder of George Floyd at the hands of the Police
- June 6th 2020: International protests in support of the Black Lives Matter movement begin
- June 30th 2020: Imperial removes its latin motto and forms Imperial History Group
- Student group forms
  - Contacts Provost for Equality
  - Surveys student body on racism and inequality experienced at university

https://www.bbc.com/news/world-us-canada-52905408
https://www.imperial.ac.uk/news/198013/new-measures-tackle-racial-inequality-imperial/

Imperial College London

The Student Response…

Open Letter on anti-racism to the Department of Mechanical Engineering

Mechanical Engineering Students present this letter to their Department, with calls of reforms to BAME support, anti-racism training and procedures dealing with racial issues.

Mech. Eng. students

To the Department of Mechanical Engineering, Imperial College London is not doing enough to support Black, minority ethnic and other under-represented students and staff. Where actions have been taken, the university has failed to effectively engage with systemic and structural problems of racism and discrimination. Imperial removing its Latin motto due to its ties to colonialism is, fundamentally, an empty gesture, one that is especially tokenistic considering the university's imperial-istic name. The College fails to take true accountability of its ties to colonialism and the legacy of the British empire. Instead of making superficial changes, we call on the university to champion effective anti-racism initiatives and support the wellbeing of its Black, ethnic minority and other under-represented students and staff.

As Mechanical Engineering students, we recognise the positive steps our department has taken toward fostering an open and supportive environment for all. It is a place where the wellbeing of students is valued, as exemplified by the encouraging work of our dedicated Senior Management Team. However, it is also a place where there are no Black staff and only a handful of Black and ethnic minority PhD students, and where conversations about race and gender inequality are limited to the minorities affected. The onus to establish action and accountability within the department has been placed solely on staff and students of the associated minorities. We believe that the onus should be shared by the majority white, male, and /or middle-class department populace.

It is for these reasons that we, the students of the Mechanical Engineering department, implore the department to act on the following fronts where anti-racism and pastoral supports for Black, ethnic minority and other under-represented communities are still lacking. We hope that such action will also catalyse change on a university-wide level, to begin tackling Imperial's deep-rooted links to racism and discrimination.

We, the students of the Mechanical Engineering department, understand that the department is already engaged in outreach aiming to "widen participation and access for Black, Asian & Minority Ethnics students" to the College (Strategic Planning Division, 2019). While this intervention is a welcome development that will undoubtedly have some positive effect, increasing the number of under-represented students without addressing the systemic racism prevalent in the university only increases the number of under-represented students dealing with the psychological stress of discrimination.

An Equality and Human Rights Committee (EHRC) inquiry into racism in higher education reported that those who make formal complaints of racial harassment often deal with a profound impact on their mental health. Out of 559 recorded complaints of racial harassment, 8% of complainants reported feeling suicidal. 1 in 20 students, who responded to the EHRC's call for instances of racial harassment, left their course, and 3 in 20 members of staff left their jobs (EHRC, 2019). We demand the department to:

1. Facilitate a departmental mental health support system equipped with counselling and support for Black, minority ethnic and other under-represented students who are experiencing racial trauma and discrimination.

   a. Employ additional student wellbeing advisors equipped with the cultural competencies and specialties for Black students and other under-represented groups.

   b. Engage in data collection & investigation to ensure there is not a mental health service access gap.

   c. Produce yearly reports recording participation and engagement to the said mental health support services.

We, the students of the Mechanical Engineering department, understand that it is the responsibility of the teaching staff, personal tutors, and administrators of the department to support the academic and pastoral demands of Black and minority ethnic students. In order to fulfil such a role, effective training is essential. Yet, the current Unconscious Bias and Active Bystander training is inadequate and generic. Staff are ill-equipped to address fundamental matters of racial inequality, institutional racisms, white privilege, and racial microaggressions in education – issues that Black and minority ethnic students face on a daily basis. Thus, it is imperative that the department:

2. Reform the current inadequate Anti-Bias work at both a staff and stu-

Photo credits: Imperial College Asset Library

STUDENT TESTIMONY

"I experienced so much racism in halls. The people I was literally surrounded with were overwhelmingly white and privileged, so I constantly felt othered. On one occasion, I made curry and ate it with my hands, this prompted a white friend to tell me that was unhygienic and disgusting. When I told him, it was completely normal in other parts of the world, other people told me to let it go and to cut him some slack. I was repeatedly called the 'token brown friend', with some saving my number as that in their phones. My white friends would complain that there were too many ethnic societies at Imperial and that third world countries should be grateful for colonisation. They would say the N-word freely and without consequence. I felt like I had to assimilate so much just to avoid ridicule and embarrassment. I changed my accent, the food I ate, and the things I enjoyed just to please people that were meant to be my friends."

Queen Victoria's Statue in the College Main Entrance

CONTINUED

STUDENT TESTIMONY

"On a university trip, I was one of only 3 people of colour. The topic of colourism came up once whilst [illegible] evidence of colourism during their trip to an African country."

1. Wellbeing support for minoritised students

2. Unconscious Bias Training Reform

3. Establish a Racial Misconduct Liason Team

4. Student Presence in Equality, Diversity, and Culture Department Committee

5. Admissions/Progression demographic data transparency

https://f001.backblazeb2.com/file/felixonlinearchive/issues/pdfs/felix_1749.pdf
https://www.facebook.com/EquityMechEng

Imperial College London

Timeline

June 2020

- ❏ BLM Protests
- ❏ College response
- ❏ Student group formation

Oct 2020

- ❏ Open Letter
- ❏ Department responds organising a town hall

Nov 2020 - Apr 2021

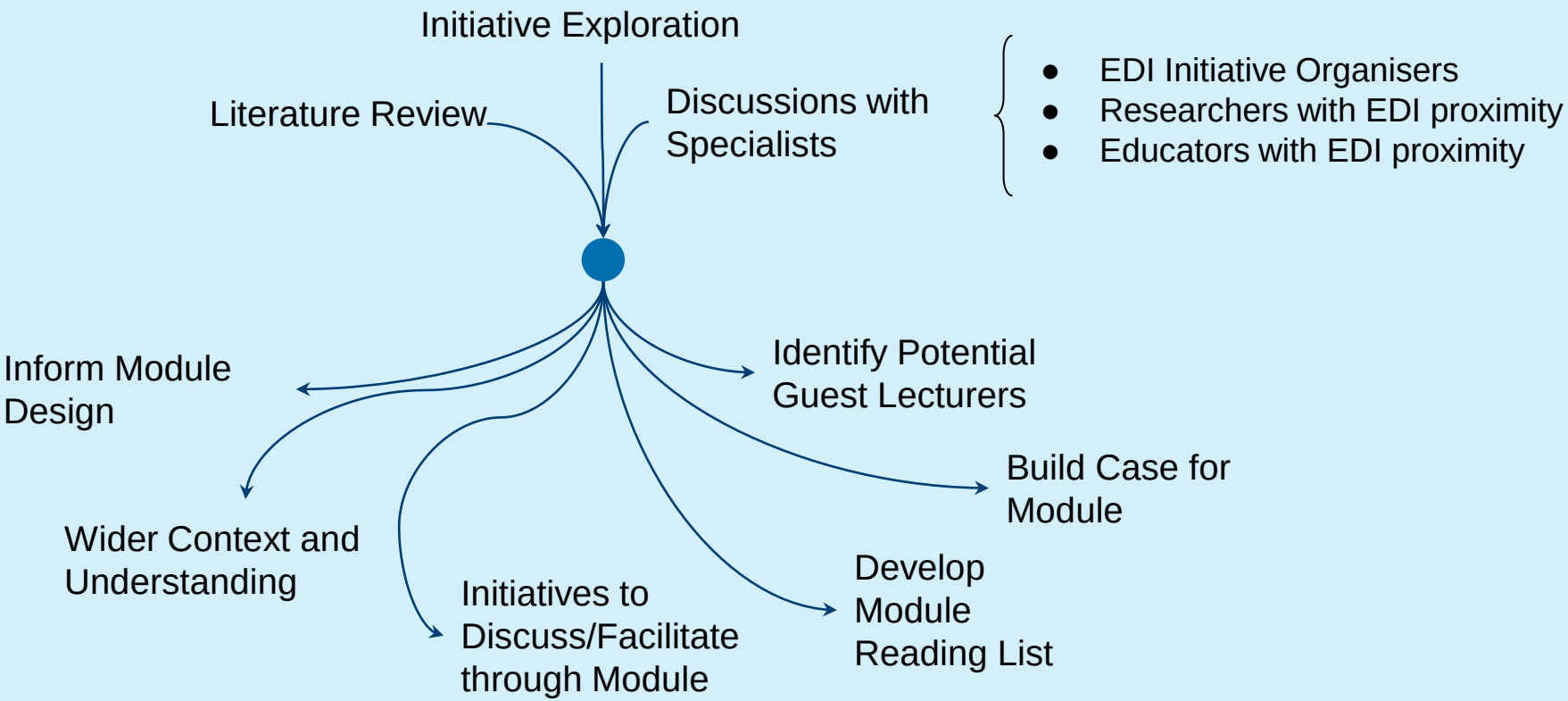
- ❏ Unconscious bias training changes
- ❏ EDI Coordinator role developed

Apr - June 2021

- ❏ Students propose an EDI in Engineering module
- ❏ Summer project to develop this begins

Imperial College London

Research to Design

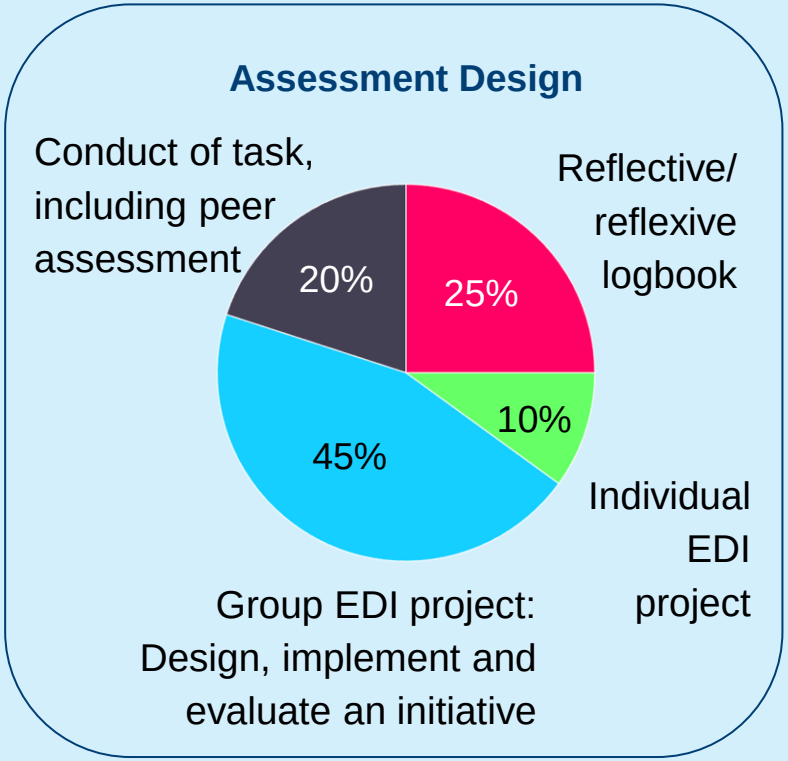


Imperial College London

Module Design

Aims + Assessment

- Encourage students to **think critically** and **proactively engage** with engineering in the **context of global society**
- Develop students' **appreciation and understanding of equality, diversity, and inclusion (EDI)** within the engineering industry, as demanded by the **IMechE Engineering Chartership**
- Students will gain **practical experience of initiative coordination**, allowing them to champion better EDI as well as **improving interpersonal skills**



Imperial College London

Student and Alumni Feedback

Points Raised in Feedback	**Means for Module to Address**
Students lacked the **structure or time** to be involved with EDI	Module provides both structure and time within the student workload and schedule
Targeted **outreach had not been commonly experienced** by underrepresented students	The module is a form of outreach itself but will also generate EDI initiatives
Potential **overconfidence** amongst non-underrepresented students	Education about positionality
Alumni indicated that **empathy was underdeveloped** by the degree programme	Naturally, the module heavily emphasises the development of empathy

Imperial College London

Communicating the Module

- **Comprehensive report on module design**
  - Detailed all the work we had done during the Summer
  - Sent to department and all those who we communicated with during the module's development

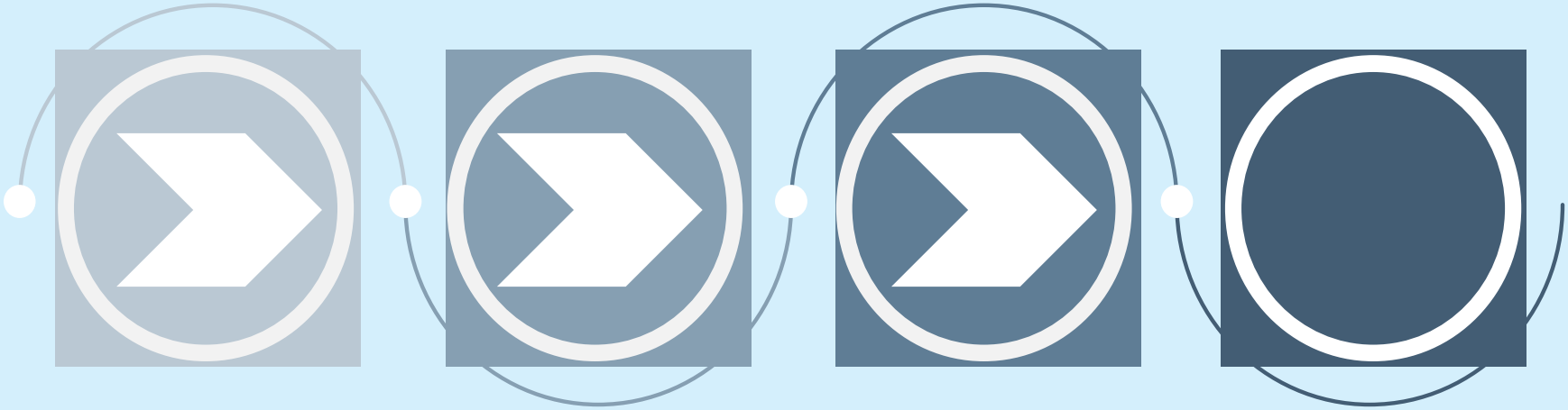
- **Presentation to Equality, Diversity, Departmental Culture Committee (EDDCC) and Courses Committee (CC)**
  - Made the case for module to be implemented within department

Leading to...

- **Module Lead hired** and **module implemented** as an **accredited,** optional module for third and fourth year students on the course from 2022/23

Imperial College London

Contents



1. Background

2. Module Creation

3. Pilot Module Implementation

4. Results of Pilot

Imperial College London

Student / Staff Collaboration

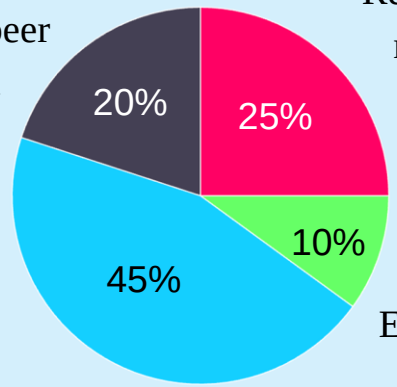
- Staff input from their teaching experiences
- Confirmation of syllabus and guest speakers
- Modification to Assessments

Imperial College London

Changes to the Module Assessment Design for Pilot Year

Initial Design

Conduct of task, including peer assessment



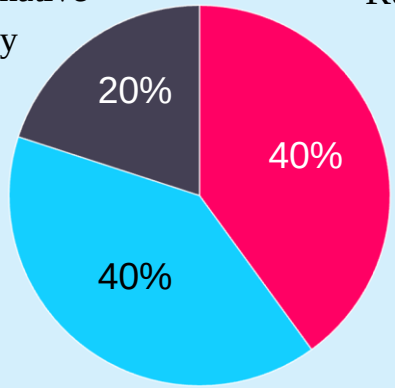
Reflective/ reflexive logbook

Individual EDI project

Group EDI project: Design, implement and evaluate an initiative

Pilot Design

Formative essay



Reflective/ reflexive logbook

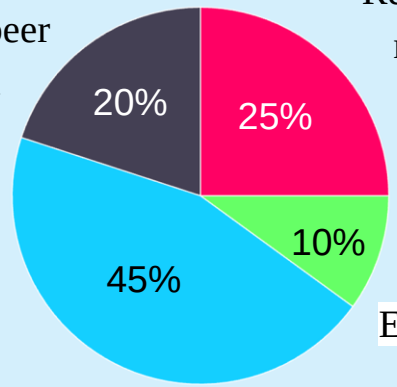
Group EDI project: Design and evaluate an initiative

Imperial College London

Changes to the Module Assessment Design for Pilot Year

Initial Design

Conduct of task, including peer assessment



Reflective/ reflexive logbook

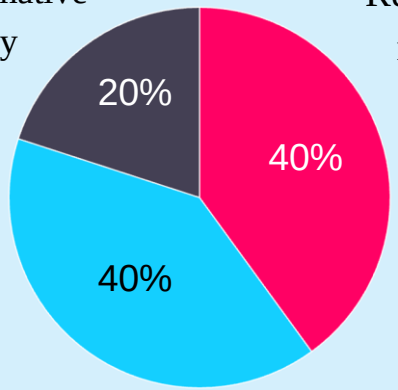
Individual EDI project

Group EDI project: Design, implement and evaluate an initiative

Removed to reduce workload

Pilot Design

Formative essay



Reflective/ reflexive logbook

Group EDI project: Design and evaluate an initiative

Imperial College London

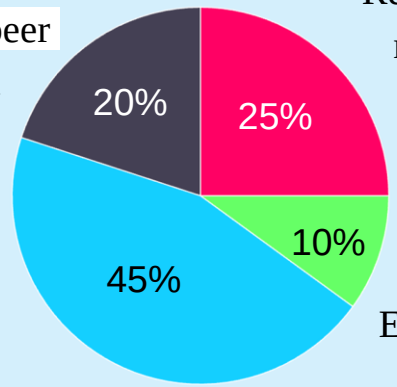
Changes to the Module Assessment Design for Pilot Year

Initial Design

Conduct of task, including peer assessment

Reflective/ reflexive logbook

Individual EDI project



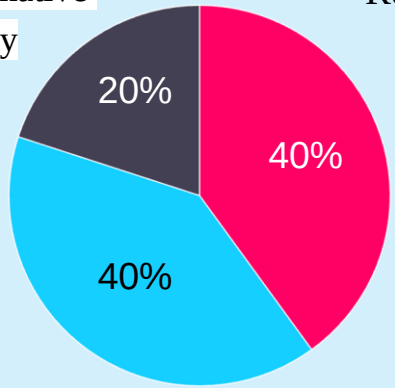
Group EDI project: Design, implement and evaluate an initiative

Reduce bias

Pilot Design

Formative essay

Reflective/ reflexive logbook



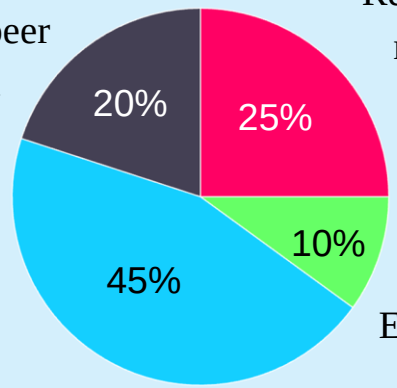
Group EDI project: Design and evaluate an initiative

Imperial College London

Changes to the Module Assessment Design for Pilot Year

Initial Design

Conduct of task, including peer assessment



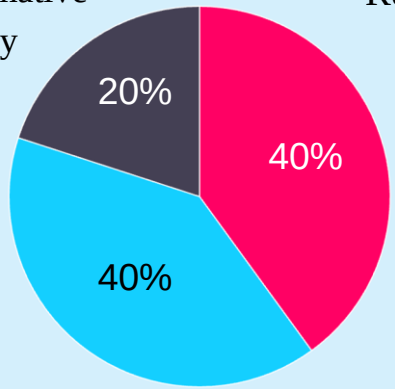
Reflective/ reflexive logbook

Individual EDI project

Group EDI project: Design, implement and evaluate an initiative

Pilot Design

Formative essay



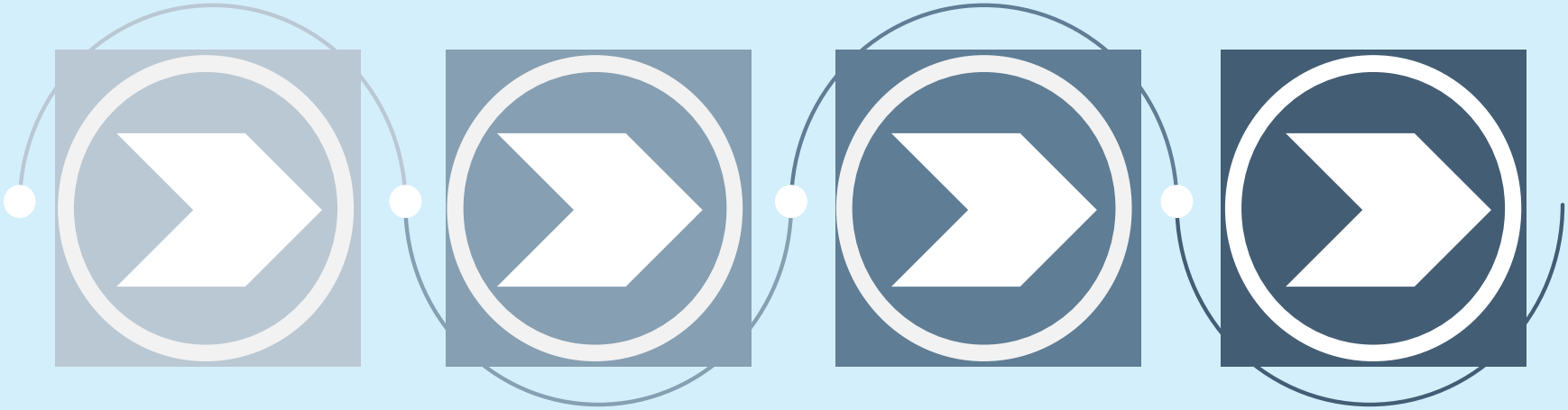
Reflective/ reflexive logbook

Group EDI project: Design and evaluate an initiative

Assessment does not rely on 3rd-party input

Imperial College London

Contents



1. Background

2. Module Creation

3. Pilot Module Implementation

4. Results of Pilot

Imperial College London

Pilot Year

- Began October 2022
- 24 Students Enrolled

QR code to the 2022-2023 syllabus

"When talking about the module a year ago the response was laughter/dismissing it, now it's seen as valuable by both students on the module and those who haven't done it"

Confidence "definitely skyrocketed" – I have the facts to back up my action and stop myself from being shut down

We are a self-selecting cohort who are already advocates so the starting baseline is higher therefore there is no dramatic change

It would be good to build skills on bid proposals and boardroom presentations and align this with the coursework

Imperial College London

Moving forward…

Encourage other institutions to adopt a similar student-led approach to teaching EDI in Engineering

- We will also either invite students from other departments to join us or to support other departments in running their own version
- We are also supporting other universities with a similar interest:
  - Presented at University of Plymouth, Inclusive Engineering Conference
  - Presenting here

Continue staff and student collaboration

- Asad, Pallavi and Angela to continue consulting the development of the module in following years
- Student focus group feedback to contribute
- Students who have taken the module to have a larger influence on module changes
- May write more detailed paper

Imperial College London

Questions and thoughts

Get in touch!

Angela Sun: as.angelasun@gmail.com

Asad Raja: asad.a.raja21@gmail.com

Pallavi Ojha: pallaviojha97@gmail.com

Chloe Agg: c.agg@imperial.ac.uk

Link to Imperial Equality, Diversity, and Culture page where you can read our module proposal

Imperial College London

References

Peters J (Director at K, Royal Academy of Engineering (Great Britain). Designing inclusion into engineering education : a fresh, practical look at how diversity impacts on engineering and strategies for change. 59.

Diversity wins: How inclusion matters. 2020 May.

Engineering Council. EngTech, IEng and CEng UK-SPEC. [Online] 2014. Available from: www.engc.org.uk

Palfrey J. Safe Spaces, Brave Spaces. MIT Press; 2018.

Godec S, King H, Archer L. The Science Capital Teaching Approach. [Online] 2017. Available from: https://discovery.ucl.ac.uk/id/eprint/10080166/1/the-science-capital-teachingapproach-pack-for-teachers.pdf

Thondhlana G, Belluigi DZ. Students' reception of peer assessment of group-work contributions: problematics in terms of race and gender emerging from a South African case study. Assessment and Evaluation in Higher Education. [Online] Routledge; 2017;42(7): 1118–1131. Available from: doi:10.1080/02602938.2016.1235133

Imperial College London

Constructive Alignment

	Define the key terms, 'equality', 'diversity' and 'inclusion', and explain how they are related to engineering, STEM and wider society.	Evaluate personal development and changes to thinking through reflection in the context of reflexive practice.	Identify actionable methods of embedding EDI into the curriculum	Devise and action an initiative within Imperial or as an outreach programme at a partner school, with a goal to improve EDI in engineering	Assess the impact of this initiative through qualitative and quantitative measures and communicate results
What is Equality, Diversity, and Inclusion	✓	✓			
Perspectives, Privilege, and Power	✓	✓			
Why is EDI Important in Engineering?	✓	✓			
Inclusive Design: Human Factors and Ergonomics	✓	✓			
'Inreach': Embedding EDI within Imperial Culture	✓	✓	✓	✓	
Introduction to Outreach	✓	✓		✓	
Science Capital and the Equity Compass	✓	✓		✓	
Neurodiversity and the Importance of Inclusive Outreach	✓	✓		✓	
Assessing the Impact of EDI Initiatives	✓	✓	✓		✓
Reflective and Reflexive Logbook	✓	✓			
Individual Coursework Component			✓		
Group Project				✓	✓
Conduct of Task		✓			

Imperial College London

Constructive Alignment

	Define the key terms, 'equality', 'diversity' and 'inclusion', and explain how they are related to engineering, STEM and wider society.	Evaluate personal development and changes to thinking through reflection in the context of reflexive practice.	Identify actionable methods of embedding EDI into the curriculum	Devise and action an initiative within Imperial or as an outreach programme at a partner school, with a goal to improve EDI in engineering	Assess the impact of this initiative through qualitative and quantitative measures and communicate results
Reflective and Reflexive Logbook	✓	✓			
Individual Coursework Component			✓		
Group Project				✓	✓
Conduct of Task		✓			

Provide feedback!

https://forms.office.com/e/pHBZpniFvB

If you used this resource, please take the time to fill out this form to provide your feedback.

If you have any questions or require more information about the REET (Resources for Embedding EDI in Teaching) project, please contact the Project Lead using the following contact details:

Chloe Agg c.agg@imperial.ac.uk