Fostering Inclusivity in Engineering Education in the South African Context

Shanali Govender, UCT
Shannon Chance, UCL
Inês Direito, UCL
Mohohlo Tsoeu, UCT
Aims and structure

- Stimulate discussion and support the development of an action plan for change
- Co-creation around scaffolding from 4 pillar model for inclusive engineering education
  - Leadership and Culture change
  - Practice
  - Content
  - Delivery
Ground Rules

- Respect: we will be respectful of each other
- When we state something as a fact that is really just our subjective viewpoint it can have the following impacts upon ourselves and others
- \( \frac{1}{x} \): in a group of \( x \), you should only talk about \( \frac{1}{x} \) of the time
- Vegas Rule: what’s discussed here, stays here
- Ouch-oops: say ouch, say oops as needed
Introductions

• Your affiliation, primary interests, why registered
• What you hope to get out of the workshop

Survey: https://docs.google.com/forms/d/e/1FAIpQLSePuWzr3WmulHWZVXyzNL4j_SWS7TSplY8ASNfiiefC3O9sbg/viewform?usp=sf_link
Group discussion

- What is inclusivity in Engineering Education and what does it look like in the South African context?
- Who could be feeling excluded in our engineering programs—how and why?
What is inclusivity in Engineering Education and what does it look like in the South African context?
Who could be feeling excluded in our engineering programs—how and why?

Who is excluded?
- Disadvantaged Ed background
- Transitions - 1st, MAs, p-t
- Gender (women, LGBTQIA+)
- 1st gen
- Disability
- Language
- Unfamiliar T3L
- Race
- People(s) who feel excluded
- Lack personal
- Cultural background academic support
- Aptitude for eng.
- Mental illness
- Introvert / Extrovert
- Admn system
- Geography - rural / urban, Philosophy
- Different experiences - screwdrivers care
- Affordability
- People who don't feel welcomed
- Don't id as an eng student
- Extended degree
- Program
- Who can't relate to role models
Group discussion... Imagining inclusion

- How would you define inclusive engineering education?
- How is inclusion defined in your institution?
YOU are a piece of the puzzle in someone else’s life. You may never know where you fit, but others will fill the holes in their lives with pieces of YOU.

Complete the quote… find your group!
Delivery!
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 - 11:40</td>
<td>Complete the quote &amp; From “Delivery” to “???”</td>
</tr>
<tr>
<td>11:40 - 12:10</td>
<td>An exercise in imagination (10+10+10)</td>
</tr>
<tr>
<td>12:10 - 12:45</td>
<td>Pedagogic choices - Success stories</td>
</tr>
<tr>
<td>12:45 - 13:00</td>
<td>Implicit Bias</td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00 - 14:35</td>
<td>Designing Assessment for Learning</td>
</tr>
<tr>
<td>14:35 - 14:55</td>
<td>A pedagogic challenge - 15% solution</td>
</tr>
<tr>
<td>14:55 - 15:00</td>
<td>Wrap up</td>
</tr>
</tbody>
</table>
Delivery!

What’s wrong with that word?
Hope lies in dreams, in imagination, and in the courage of those who dare to make dreams into reality.
Imagination is the beginning of creation. You imagine what you desire, you will what you imagine and at last you create what you will.
In your pairs,
  ○ Tell a success story.
  ○ Give each story a title.

In your groups,
  ○ Share your insights.
  ○ List your insights on a chart.
  ○ Have one person ready to share with the group.
Implicit Bias

Can you change implicit bias?

May 25, 2018 | 8:22 PM EDT

"Think of implicit bias as the thumbprint of the culture on our brain." Harvard University social psychologist Mahzarin Banaji describes how institutions can effectively deal with bias.
**Gender - Career.** This IAT often reveals a relative link between family and females and between career and males.

**Native American** ('Native - White American' IAT). This IAT requires the ability to recognize White and Native American faces in either classic or modern dress, and the names of places that are either American or Foreign in origin.

**Presidents** ('Presidential Popularity' IAT). This IAT requires the ability to recognize photos of Donald Trump and one or more previous presidents.

**Weight** ('Fat - Thin' IAT). This IAT requires the ability to distinguish faces of people who are obese and people who are thin. It often reveals an automatic preference for thin people relative to fat people.

**Religion** ('Religions' IAT). This IAT requires some familiarity with religious terms from various world religions.

**Skin-tone** ('Light Skin - Dark Skin' IAT). This IAT requires the ability to recognize light and dark-skinned faces. It often reveals an automatic preference for light-skin relative to dark-skin.

**Weapons** ('Weapons - Harmless Objects' IAT). This IAT requires the ability to recognize White and Black faces, and images of weapons or harmless objects.

**Arab-Muslim** ('Arab Muslim - Other People' IAT). This IAT requires the ability to distinguish names that are likely to belong to Arab-Muslims versus people of other nationalities or religions.

**Asian American** ('Asian - European American' IAT). This IAT requires the ability to recognize White and Asian-American faces, and images of places that are either American or Foreign in origin.

**Age** ('Young - Old' IAT). This IAT requires the ability to distinguish old from young faces. This test has been used among diverse populations for many years and has been employed in multicountry studies.
What is the Race IAT?

The Implicit Association Test (IAT) measures the strength of associations between concepts (e.g., Black people, White people) and evaluations (e.g., Good, Bad). A higher score indicates a greater preference for White people over Black people. These plots represent 7983 participants, which is a random sample of 0.05% of people who took the Race IAT between 2007 and 2016. The average IAT score for this overall sample is 0.311 (SD = .44) indicating a moderate implicit preference for White over Black people.

Who do you want to see the distribution of Race IAT-scores for?

Below, choose whether to graph IAT scores by participant race

All

What demographic factors correlate with scores on the Race IAT?

Below, choose a variable to see its correlation with scores on the Race IAT

Age

Do Race IAT scores correlate with other factors?

There is a negligible correlation between age and scores on the Race IAT, r = -0.029, p = 0.018.
Pandora’s box - A freewriting activity

I know that I have a bias towards/ against…
LUNCH?
YES!
“Assessment makes more difference to the way that students spend their time, focus their effort, and perform, than any other aspect of the course they study, including the teaching. If [lecturers] want to make their course work better, then there is more leverage through changing aspects of the assessment than anywhere else…” (Gibbs, 2010)

“When I retook the exam, I just concentrated on passing the exam. I got 96% and the guy couldn’t understand why I failed first time. I told him this time I just concentrated on passing the exam rather than understanding the subject. I still don’t understand the subject so it defeated the objective in a way.” (Gibbs, 1992, p.101)
What does assessment do?

- To check how much/what students know
- To grade performance; certificate
- To differentiate/ separate/ classify students
- To facilitate learning
- To promote/model thinking
- To assess our teaching
- To reflect on our purposes/aims/goals

(Newton 2007)
Assessment (for learning)

- an integral component of instruction,
- located within **collaborative learning environments** that
  - engage **students as active participants** in the assessment and feedback process,
  - foster **meaningful, authentic engagement** with the discipline, and
  - support the development of **evaluative expertise** in students.
● Brainstorm all the assessments in a course.
● For each assessment answer the following:
  1. What is the purpose of the assessment task?
  2. What does the assessment task aim to assess?
  3. What format or shape does the task take?
  4. Who is involved in the assessment and how do they participate?
  5. How are students prepared for assessment?
  6. What happens with the products and outcomes of the assessment?
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Learning outcomes assessed</th>
<th>Format or shape</th>
<th>Feedback</th>
<th>Who is involved and how?</th>
<th>Products and outcomes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact week</td>
<td>Daily reflection</td>
<td>Related to daily themes</td>
<td>Short reflective, blog post after conversation</td>
<td>Formative feedback, rubric for students, voice note from staff?</td>
<td>Peer &amp; staff comments</td>
<td>Largely formative, work completed mark</td>
</tr>
<tr>
<td>Week 1</td>
<td>Learning design plan</td>
<td>LO 1, 2, 4</td>
<td>Template provided</td>
<td>Formative feedback, rubric for students, feedback on student doc in google docs?</td>
<td>Peer &amp; staff comments</td>
<td>15% of final mark</td>
</tr>
<tr>
<td>Week 2</td>
<td>No assessment activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>Draft Design Rationale</td>
<td>LO 1, 3, 4, 5</td>
<td>Template provided</td>
<td>Extensive written and verbal formative feedback</td>
<td>Staff</td>
<td>Formative</td>
</tr>
</tbody>
</table>
(1) The purpose of the assessment task?

- **Diagnostic purposes:** identifies students’ strengths and weaknesses for selection, admission and placement.
- **Formative purposes:** enhances learning by providing feedback to allow students to develop the valued knowledge, skills and attitudes of the discipline.
- **Summative purposes:** informs judgments about students’ achievements for example, promotion and certification.
- **Evaluative purposes:** informs judgments about the quality of a course or programme for programme accreditation and departmental review.
(2) What does the assessment task aim to assess?
… (2) is there Constructive Alignment?
(3) Format or shape of the task?

- Group brainstorm - chart paper
- All the kinds of tasks we use...
(4) Who is involved and how?

**Expert**
- Validity
- Reliability etc

**Peer**
- Tools
- Feedback to their peers
- Formal assessment
- Impact on markers

**Self**
- Opportunity to develop judgement skills, critiquing abilities and self-awareness.
(5) How are students prepared for assessment?

(6) What happens with the product of assessment?
15% Solution

1. On your own, what’s the inclusivity/classroom challenge you want to work on? (2min)
2. What’s your 15% solution? (3min)
3. Share with your group. (15min)
Wrap up

- On a post it - something that’s in your brain
- On a post it - something that’s on your heart
Extra slides
Force maps

- a graphical representation of the context of a design challenge
- includes iconic representations of
  - the key elements of the teaching and learning context (social, material and intentional factors)
  - the relationships between them - marked "+" when supportive, and "-" when indicating a tension.
- The design challenge can often be defined in terms of resolving some of these tensions.
Mapping your space

Step 1: List factors, concerns and “forces” in your context.

Step 2: Note the relations between the forces. Mark supporting relations with “+” and conflicting relations (or tensions) with “-”.

Step 3: Place your personas on the drawing canvas. Connect them to their concerns (represented by icons).

Step 4: What mediates between the personas and their concerns.
Appendix 1: Overview of development of Taxonomies and their domains

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Cognitive</th>
<th>Affective</th>
<th>Psychomotor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-10</td>
<td>Fink (2003) Foundational knowledge; Caring: Learning about oneself;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cognitive

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Psychomotor

- Reflex Movements
- Basic Fundamental Movement
- Perceptual
- Physical Activities
- Skilled Movements
- Non-discursive Communication
- Receiving
- Responding
- Valuing
- Organization
- Characterization by Value Set

Affective

- Characterization by Value Set
- Organization
- Valuing
- Responding
- Receiving
- Evaluation
- Synthesis
- Analysis
- Application
- Comprehension
- Knowledge
Bloom's Taxonomy

1. Remember
   - Recall facts and basic concepts
     - define, duplicate, list, memorize, repeat, state

2. Understand
   - Explain ideas or concepts
     - classify, describe, discuss, explain, identify, locate, recognize, report, select, translate
   - Use information in new situations
     - execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch

3. Apply
   - Draw connections among ideas
     - differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test
   - Use information in new situations
     - execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch

4. Analyze
   - Justify a stand or decision
     - appraise, argue, defend, judge, select, support, value, critique, weigh
   - Draw connections among ideas
     - differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test

5. Evaluate
   - Justify a stand or decision
     - appraise, argue, defend, judge, select, support, value, critique, weigh
   - Draw connections among ideas
     - differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test

6. Create
   - Produce new or original work
     - design, assemble, construct, conjecture, develop, formulate, author, investigate
<table>
<thead>
<tr>
<th>Affective Domain (Feeling, Attitudes)</th>
<th>definition</th>
<th>responding</th>
<th>valuing</th>
<th>organization</th>
<th>internalizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>definition</td>
<td>receiving</td>
<td>valuing</td>
<td>organization</td>
<td>internalizing</td>
</tr>
<tr>
<td>- Selectively attends to stimuli</td>
<td>- responds to stimuli</td>
<td>- attaches value or worth to something</td>
<td>- conceptualizes the value and resolves conflict between it and other values.</td>
<td>- integrates the value into a value system that controls behavior.</td>
<td></td>
</tr>
<tr>
<td>Sample Verbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Accept</td>
<td>- agree to</td>
<td>- adopt</td>
<td>- adopt</td>
<td>- act upon</td>
<td>- serve</td>
</tr>
<tr>
<td>- Acknowledge</td>
<td>- answer freely</td>
<td>- assume responsibility</td>
<td>- advocate</td>
<td>- defend</td>
<td>- support</td>
</tr>
<tr>
<td>- Be aware</td>
<td>- assist</td>
<td>- behave according to</td>
<td>- adjust</td>
<td>- exemplify</td>
<td>- justify behavior</td>
</tr>
<tr>
<td>- Listen</td>
<td>- care for</td>
<td>- choose</td>
<td>- arrange</td>
<td>- influence</td>
<td>- maintain</td>
</tr>
<tr>
<td>- Notice</td>
<td>- communicate</td>
<td>- commit</td>
<td>- balance</td>
<td>- influence</td>
<td>- serve</td>
</tr>
<tr>
<td>- Pay attention</td>
<td>- comply</td>
<td>- desire</td>
<td>- classify</td>
<td>- justify behavior</td>
<td>- support</td>
</tr>
<tr>
<td>- Tolerate</td>
<td>- conform</td>
<td>- exhibit loyalty</td>
<td>- conceptualize</td>
<td>- motivate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- consent</td>
<td>- express</td>
<td>- formulate</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- contribute</td>
<td>- initiate</td>
<td>- rank</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- cooperate</td>
<td>- prefer</td>
<td>- serve</td>
<td>- maintain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- follow</td>
<td>- seek</td>
<td>- support</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- obey</td>
<td>- show concern</td>
<td>- rank</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- participate willingly</td>
<td>- show continual desire to</td>
<td>- rank</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- respond</td>
<td>- use resources to</td>
<td>- rank</td>
<td>- organize</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- volunteer</td>
<td>- theorize</td>
<td>- rank</td>
<td>- organize</td>
<td></td>
</tr>
</tbody>
</table>
Receiving/Attending

Willing to be aware of the setting or situation, gives attention by choice, open to the experience

Responding

Motivated to invest, Chooses to behave in a certain way frequently, Begins to identify with a behavior and commit to it

Valuing

Willingly participating, obedient, volunteers, finds satisfaction in participating, ready to respond

Values become systematic, can compare and contrast values and choices, begins to order and prioritize values, chooses to commit to certain values and behaviors

Organizing

Acts consistently due to an internal belief, Can articulate a philosophy or world-view, Can break down complex situations and respond accordingly based on values, develops and lives by a code of personal behavior

Characterizing

by @henrythiele
<table>
<thead>
<tr>
<th>Level</th>
<th>Characteristic</th>
<th>Some Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>Developing awareness of ideas and phenomena</td>
<td>Ask Follow Reply Accept Prefer</td>
</tr>
<tr>
<td>Responding</td>
<td>Committing to the ideas etc by responding to them</td>
<td>Answer Recite Perform Report Select Follow Explore Display</td>
</tr>
<tr>
<td>Valuing</td>
<td>Being willing to be seen as valuing certain ideas or material</td>
<td>Justify Propose Debate Relinquish Defend Initiate</td>
</tr>
<tr>
<td>Organization and Conceptualisation</td>
<td>To begin to harmonise internalized values</td>
<td>Arrange Combine Compare Balance Theorize</td>
</tr>
<tr>
<td>Characterisation by Value</td>
<td>To act consistent with the internalised values</td>
<td>Discriminate Question Revise Change</td>
</tr>
</tbody>
</table>
Psychomotor Domain
(Doing, Skills)

<table>
<thead>
<tr>
<th>Perception</th>
<th>Definition</th>
<th>Set</th>
<th>Guided Response</th>
<th>Mechanism</th>
<th>Complete Overt Response</th>
<th>Adaption</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senses cues that guide motor activity</td>
<td>Imitates and practices skills, often in discrete steps</td>
<td>Performed acts with increasing efficiency, confidence, and proficiency</td>
<td>Performs automatically.</td>
<td>Adapts skill sets to met a problem situation</td>
<td>Creates new patterns for specific situations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Verbs**
- Detect
- Hear
- Listen
- Observe
- Perceive
- Recognize
- See
- Sense
- Smell
- Taste
- View
- Watch

**Sample Verbs**
- Achieve a posture
- Assume a body stance
- Establish a body
- Place hands, arms etc.
- Position the body
- Sit, stand, station
- Copy
- Duplicate
- Imitate
- Manipulate
- Guidance
- Operate under supervision
- Practice
- Repeat
- Try

**Sample Verbs**
- Act habitually
- Advance with assurance
- Control
- Excel
- Guide
- Maintain efficiency
- Manage
- Master
- Organize
- Perfect
- Perform
- Automatically

**Sample Verbs**
- Adapts
- Reorganizes
- Alters
- Revises
- Changes
Psychomotor Domain
(Bloom, 1956; Simpson, 1972)

Suggested by Bloom, 1956 with categories created by Simpson, 1972

- **Perception**
  - Choose
  - Detect
  - Differentiate
  - Distinguish
  - Hear
  - Identify
  - Isolate
  - Listen
  - See
  - Select

- **Set**
  - Begin
  - Display
  - Explain
  - Move
  - Place
  - Position
  - Proceed
  - React
  - Show

- **Guided Response**
  - Attempt
  - Copy
  - Duplicate
  - Follow
  - Imitate
  - Practice
  - Repeat
  - Reproduce

- **Mechanism**
  - Adjust
  - Assemble
  - Build
  - Calibrate
  - Conduct
  - Demonstrate
  - Execute
  - Fasten
  - Illustrate
  - Manipulate
  - Set up

- **Complex Overt Response**
  - Carry out
  - Control
  - Direct
  - Guide
  - Operate
  - Manage
  - Maneuver
  - Manipulate
  - Organize
  - Perform
  - Proceed

- **Adaptation**
  - Adapt
  - Alter
  - Change
  - Modify
  - Rearrange
  - Reorganize
  - Revise

- **Origination**
  - Arrange
  - Build
  - Combine
  - Compose
  - Construct
  - Create
  - Design
  - Originate

Image created by Varonis and Newhall, 2013
<table>
<thead>
<tr>
<th>Level</th>
<th>Characteristic</th>
<th>Some Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception/Observing</td>
<td>Here the student is simply observing the procedure</td>
<td>Observe, Listen, Detect</td>
</tr>
<tr>
<td>Guided Response/Imitation</td>
<td>The student can follow instructions but needs to be instructed</td>
<td>Copy, React, Follow, Reproduce</td>
</tr>
<tr>
<td>Mechanism</td>
<td>This is an intermediate stage where proficiency and confidence are growing</td>
<td>Organise, Manipulate</td>
</tr>
<tr>
<td>Complex response</td>
<td>Proficiency has grown and performance is quick and accurate with little or no hesitation</td>
<td>The verbs are essentially the same as Mechanism, but modified by 'accurately' or 'quickly'</td>
</tr>
<tr>
<td>Adaptation</td>
<td>The student has such ability that they can combine and integrate related aspects of the skill without guidance</td>
<td>Reorganise, Alter, Rearrange, Vary, Internalise</td>
</tr>
<tr>
<td>Origination</td>
<td>The student has internalized automatic mastery of the skill</td>
<td>Compose, Construct, Design, Initiate, Create</td>
</tr>
</tbody>
</table>
Barriers to learning

Inês & Shanali
11:00 - 12:30
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 - 11:10</td>
<td>Human spectrogram</td>
</tr>
<tr>
<td>11:10 - 11:40</td>
<td>Building a (shared) (theoretical) language</td>
</tr>
<tr>
<td>11:40 - 11:45</td>
<td>Identifying barriers</td>
</tr>
<tr>
<td>11:30 - 11:45</td>
<td>Lessons from the literature</td>
</tr>
<tr>
<td>11:45 - 12:20</td>
<td>Working with cases</td>
</tr>
<tr>
<td>12:20 - 12:30</td>
<td>Wrap up</td>
</tr>
</tbody>
</table>
Human spectrogram
Activity: Building a language

1. Prejudice & Bias
2. Inclusivity
3. Diversity
4. Social Justice
5. Transformation
6. Decoloniality
7. Equity & Equality
8. Privilege
9. Intersectionality
10. Positionality
Key concept: Positionality

- Self-identity
- Position in society

race  
class  
gender  
sexuality  
ability  
status
Key concept: Intersectionality

Intersectionality
We are each the intersection

of various identities, perspectives, and privileges.
Key concept: Privilege
Key concepts: Equity & equality

Equity - giving people what they need to be successful

Equality - treating everyone the same
Key concept: Social justice

Social Justice

Recognising the systemic, structural inequalities and injustices in society and working to change them.
Key concept: Diversity

DIVERSITY

- Understanding each individual is different & recognising our individual differences

→ recognise & acknowledge (self awareness)

& accept differences
Key concept: Inclusivity
Key concept: Decoloniality

DECOLONIALITY

Developing & evolving old sets of rules, regulations, acts being used during minority rule, to include diversity & preservation of traditional scientific & technological systems through engineering.
Key concept: Transformation

TRANSFORMATION

- Change from 1 thing to another
- Awareness & understanding where you ARE & make a decision where to move to achieve inclusivity/... and how to most effectively do that.
Key concept: Prejudice and Bias

Prejudice & Bias

Pre-judging - stereotyping
(Based on individual’s membership of a social group)

Gender, Race, Culture, Religion, Language

Bias - practice of prejudice
Positionality

“... stance or positioning of the researcher (educator) in relation to the social and political context of the study (context of teaching) - the community, the organization or the participant group” (Coghlan & Brydon-Miller, 2014)

“The notion of positionality rests on the assumption that a culture is more than a monolithic entity to which one belongs or not (...) Positionality is determined by where one stands in relation to ‘the other’ (...)”, however, these positions can shift (Marriam et al., 2001)

By exploring facets of our own personal perspective or positionality, we can begin to more adequately understand the phenomenon of interest involving individuals with different life experiences than our own.
Intersectionality

“... a way of mediating the tension between assertions of multiple identity and the ongoing necessity of group politics (...) Through an awareness of intersectionality, we can better acknowledge and ground the differences among us and negotiate the means by which these differences will find expression in constructing group politics.” (Crenshaw, 1991)
Privilege

Privilege refers to unearned advantages that accrue to us that we are able to take for granted.

Most privileges are contextually specific.

Privilege is often invisible to those who have it, while simultaneously apparent to those who lack that particular kind of privilege.

“One privilege of the privileged is not to see their privilege.” (Acker, 2006)
Equality & Equity

**Equality** usually adopts a ‘one-size-fits-all’ strategy

**Equity** is an expression of social justice

*Image courtesy Maryam Abdul-Kareem*
Social Justice

Social justice practices, including those by engineers, should attempt to an equal distribution of rights, opportunities and resources in order to enhance human capabilities and reduce the risk and harms among the citizens of a society. (Lucena, 2013)
Diversity

“...considers similarities and differences in terms of age, ethnicity, disability, gender and religion; and less visible differences such as sexual orientation, disability [also], religion, educational background, personality type, nationality etc.” Royal Academy of Engineering

Diversity is a characteristic of groups, not individuals
Inclusion

“...is about the culture, environment and processes created by an organisation. It is measured by how people feel and it needs effort to achieve. Creating a culture of inclusiveness is about establishing behaviours that support inclusion.” Royal Academy of Engineering
Decoloniality can best be understood as a call for a type of cognitive justice based on an overhaul and expansion of the Western knowledge canon. The call is also for knowledge pluralisation, which refers to the incorporation of the complex ways of knowing of subaltern and all previously excluded groups (Fataar and Subreenduth 2015).
Identifying barriers

https://tinyurl.com/EBE2019
Access code: Barriers2019
Lessons from the literature

White male engineers feel that the culture of engineering is more inclusive than female engineers who in turn feel that it is more inclusive than engineers from Black, Asian and Minority Ethnic (BAME) backgrounds.

“Creating cultures where all engineers thrive - A unique study of inclusion across UK engineering” (Royal Academy of Engineering)
Lessons from the literature

Underlying barriers to progress on inclusion in engineering:

- The “inclusion privilege”
- The perception that there is no ‘crisis of inclusion’
- The need to deliver progress on intangible outcomes related to perception and experience which may be at odds with engineering culture
Lessons from the literature

- Inclusivity in engineering education - multidisciplinary approach

Example: Research on Empathy in Engineering Education

increased empathy can contribute to communication, design processes, professional success, ethics, and the overall culture of engineering
• Self-awareness, emotional expression and a sense of personal responsibility
• Respect for differences in interests, needs, and culture
• Healthy and thoughtful interactions with peers
• A sense of personal agency, leadership, and accountability within a group
Working with case studies

Examine your case study in light of the following:

1. What do you need to find out about the situation?
2. Who do you need to involve?
3. Does your institution have any policies or resources that are of relevance in relation to this case?
4. What possible responses are open to you?
5. How might your positionality impact on your choices in relation to this case study?
6. How might the concept of intersectionality help you to understand what is happening in this case study?
Case Study – Quick hands

Chao observed a problem in her course: when she asked a question, very few students offered to answer it. The students who did want to speak would typically sit in the front of the class, shoot up their hands to answer every question, and blurt out comments. Because these few hands shot up in the air so quickly, other students did not seem inclined to speak.

What would you suggest she do?
Case Study – Always in a rush

Sarsha runs a weekly tutorial for her Mathematics for Engineers course. Students may work in groups during the tutorial and are required to hand in the work immediately after. She notices that Sean is always late, comes in looking rushed, and leaves as quickly as possible. He often submits incomplete work when he does leave, but what he hands in is reasonable.

What would you suggest she do?
Case Study – Diversity challenges

Blake has runs an introduction to engineering course. He believes it’s important for students to learn to work in diverse groups, so he decides the groups based on gender, marks and ethnicity. At the end of the project, Blake is horrified by the feedback. Many of the students hated the project and he realises that he has made many assumptions about the process.

What would you suggest he do?
Lindsey teaches a large undergraduate class. One day, he’s taking questions and says, “Yes, the lady at the back in the blue shirt?”

The person responds, “I’m a ‘he’.”

Embarrassed, Lindsey says, “But you look like a girl.”

The person blushes and Lindsey moves on to another student.

What would you suggest Lindsey do?
Case study - Invisible obstacles

Jacob is introducing his class to hands-on work in the workshop, so he organises a tour of the busy facility in groups. Part-way through the tour, he notices that one of his students is hanging further and further back, is mumbling to himself, and looks like he’s counting on his fingers. Suddenly, the student turns around and dashes from the room, almost knocking over a workshop assistant in his rush. Later the student finds Jacob and explains that he is on the spectrum and that the workshop is a very difficult environment.

What would you suggest Jacob do?
BLACK, ASIAN AND MINORITY ETHNIC STUDENT ATTAINMENT AT UK UNIVERSITIES: #CLOSINGTHEGAP
Wrap-up

- A question
- An insight
- A feeling