# Lecture 6 – EDI Lecture Notes

## Introduction to Outreach and Engagement

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Terminology

* WP – Widening Participation – Students who do not “traditionally go to university”, e.g. they are from a low socio-economic background / first generation to university / have caring duties
* Outreach – Speaking in schools
* Public Engagement – Speaking to adults/the general public (e.g. the Great Exhibition Festival, Imperial Lates)
* Societal Engagement – Outreach + Public Engagement (commonly an Imperial specific term)
* OFS – Office for Students – Body for protecting the interests of students
* REF – Research Excellence Framework – like [Ofsted](https://www.gov.uk/government/organisations/ofsted) for Universities, a benchmarking tool for how “good” universities are at research
* Impacts – What are the outcomes after you have done your project?
* KTPs – Knowledge Transfer Partnership – When you connect with industry and have a two way channel
* Citizen Science – doing things with the general public (especially online) where they can do data gathering, started with [Galaxy Zoo](https://www.zooniverse.org/projects/zookeeper/galaxy-zoo/) using “wisdom of the crowd” – this means the most popular answer is usually the right one.

Why do outreach etc.?

* Altruism – it’s the right thing to do + we are paid for by the tax payer, if we want money from public we need to justify it
* Grants – it’s often required by funding bodies
* REF – it’s expected by the framework
* Promotion – outreach is often required for promotion
* Transferable skills – if you can talk in front of 200 thirteen year olds then you will be able to talk in front of conferences, job interviews etc. Government writes for a reading age of 14 as that’s what most of the general public have, therefore communicating at this level is really important
* Marginal gains applying for jobs – adds a string to your bow, differentiates you from others
* Re-enthuse you about your subject – you gain the enthusiasm of the children/enthusiasts and remind you why you do what you do
* Communicate with fellow scientists – from transferable skills but they may also be working with you on outreach / engagement projects
* OfS – They require a certain amount of WP students, therefore engagement is needed to recruit these students. This is called the access agreement.
* Societal benefits – society needs to know what we are doing

One example:

NASA funding rounds coincide with news stories about possibility of asteroids hitting earth; there is a use in society/taxpayers valuing what we do!

[Faraday Lecture Theatre](https://venue.rigb.org/our-spaces/theatre) – used for the [Christmas Lectures](https://www.rigb.org/christmas-lectures)….based on an “operating theatre” as people used to watch operations

[Carl Sagan](https://en.wikipedia.org/wiki/Carl_Sagan) “[Cosmos](https://en.wikipedia.org/wiki/Cosmos:_Possible_Worlds)” (redone now by [Neil deGrasse Tyson](https://en.wikipedia.org/wiki/Neil_deGrasse_Tyson)) who famously presented on TV about space

BBC “[turtle](https://en.wikipedia.org/wiki/Turtle_(robot))” was a computer science outreach tool

MMR and the “link” to autism etc. This was eventually disproved, but for a long time it has been part of the public consciousness that the jab was dangerous. Similar for genetically modified food. One important aspect of public engagement then is for scientists to challenge and disprove poor quality science in the media. This resulted in the Science Media Centre (part of the Royal Institute) so journalists could always find experts to consult prior to publishing. Now universities all have press teams in order to publish sound science, and to “sell” what we do to gain public buy-in. The government also has a policy for raising the science literacy of the general public.

All of this can be summarised as being because/in order to:

* We’re all publicly funded
* Dispel myths
* Role models
* Be open about results
* Achieve a scientifically literate population
* Justifying Fees!

COVID: Exaggerated and highlighted educational inequality

For a fire to take hold you need the fire triangle: Heat, Oxygen, Fuel

For university success you need a similar “triangle” – Family, Environment, Education

Family:

* Parents, guardians, carers – they might not understand the routes of getting their children into engineering and science
* Need an understanding of the education system (e.g. Simon couldn’t help his reception age child with maths as he didn’t understand how it was being taught despite having a PhD in physics)
* Level of education = support (you can only support with as much knowledge as you have)
* Tutoring (some families fill the educational gap with tutoring, but not everyone can afford this)
* Home schooling through COVID (has exaggerated the gaps)
* Lack of STEM role models
* Lack of science capital in the family
* Food banks (as a means of access to those who most need support)

Environment:

* Role models in society (do we see ourselves, our gender/ethnicity/accent, in science)
* Access to extra-curricula activities (universities increasingly expect high levels of attainment on the UCAS statement, but not everyone can access/afford these things. Extended essays, EPQs, CREST Awards etc are not available at all schools)
* Economic situation (students may need to work therefore no time for study/extra curricula)
* Institutional barriers (unconscious bias, etc.)
* Changing ‘environment’ (professional environment awareness; how to speak in meetings, how to dress, etc. wealthier families are more likely to have and impart this knowledge to their children)

Education - Primary

* Only 5% of primary teachers have a science qualification above GCSE, meaning primary science education is not being done by those with confidence in this area
* Lack of science specialist primary teachers, so others are filling the gap but without the knowledge
* SATs have been removed for science so we have no data on the scale of the issue
* Primary is not really a focus for Universities as they are aiming to recruit rather than to educate
* COVID forced focus elsewhere, therefore the science education gap has fallen even further behind
* Primary science report is in the slides/pre-reading for further details

Education – Secondary

* Lack of qualified physics teachers (something like 40% of UK schools have a physics teacher with a physics degree)
* Impact of COVID – people who have missed part of their syllabus
* Access to tutoring
* Teacher backgrounds – teachers with Oxford/Cambridge backgrounds can train the children to pass the entrance interview, schools without teachers with this background it is much harder to attain this support
* Access to technology/labs
* A-Level tutoring
* More detail on this on the slides with respect to disadvantage in secondary schools relative to the numbers of free school meals (i.e. low economic levels)

## Part 2: Supporting Widening Participation students to succeed

Jackie Bell – Computer Science Teaching Fellow

* PhD in physics, first generation to university, low income background, family with very little understanding of university (e.g. when moving on to masters and PhD was asked by Dad “why do you keep failing university and having to go back?”)
* >10 years of outreach with schools, communities, youth workers, etc.
* Leads the Imperial Engineering Diversity Impact Programme (funded by the Royal Academy of Engineering) which supports WP students in transition to university

Imperial offers lots of support to students before getting to University, e.g.

* Summer schools
* Academic tutoring
* Application/interview mentoring
* STEM Future (BAME focussed)
* Work Experience

Universities are required by OfS to provide a “5 year Access and Participation Plan” to improve marginalised groups accessing university. In the 20-21 academic year this was backed up by £313 million for from OfS.

Imperial’s APP is here: <https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/academic-policy/admissions/22-entry/Access-and-participation-plan-2020-21-to-2024-25.pdf>

Yet, only 5% of students at “elite universities” (e.g. Imperial, Oxford, Cambridge) are WP. Only ~10% of WP offer holders attain their offer condition exam grades. During COVID and teacher assessed grades, the algorithm used to select who should get grades initially was biased against schools with higher numbers of free school meals.

Once you’ve arrived there are then many more issues to success;

* How you have been taught to learn
* How you have been taught to pass exams
* How you look / how you talk
* What your expectations are on arrival

Data shows that lower income students are more likely to drop out; they don’t necessarily have someone who can offer help, proof read, provide a quiet place to study, etc.

OfS data shows a 14.8pp difference in continuation rate (remaining in university) and 21.9pp difference in progression rate (movement into employment) for students from low income backgrounds. Those students express feelings such as “I don’t see anyone who looks like me”, “No one wants to speak to me”. To support these students we have the Working Class Network at Imperial so students can find someone like themselves and reduce feelings of isolation. Even knowing that the network exists can be impactful whether students attend or not.

Imperial has a strategy 2020-2025 which talks about enriching the student experience, including ”all students feel a sense of belonging”. This has resulted in many changes (such as Jackie’s role and that of Chloe and Sophia). It has also resulted in the Student Shaper projects / Educational UROPs such as the one which created this module! More examples are available on the slides.

Jackie leads a project along these lines, funded by RAEng which runs a pre-freshers week for WP students to come early, build relationships, get support and get to know campus and departmental staff. The programme is proving very successful in creating a community for these students.

