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Using ‘Science Capital’ to understand what teachers want from Science Outreach

A case-study at the Wohl Reach Out Lab (WROL)

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Research Context- Wohl Reach Out Lab

- Imperial College London's dedicated outreach space.
- Founded in 2010 by Professor Robert Winston
- 16,126 pupils attended 1,227 activities since the WROL opened
- Focus on practicals for students who otherwise would not have access to 'hands on' science.

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Outreach Programmes at Imperial

- Programmes that Imperial run through the Outreach team:
  - Schools partnerships
  - *Ad hoc* school visits
  - Summer schools
  - Imperial Sutton Scholars
  - Pimlico Connection
  - STEM Potential
  - Spectroscopy in a Suitcase
  - Pathways to Medicine
  - School's Challenge Programme
  - Maker Challenge Programme
  - INSPIRE PGCE teacher training

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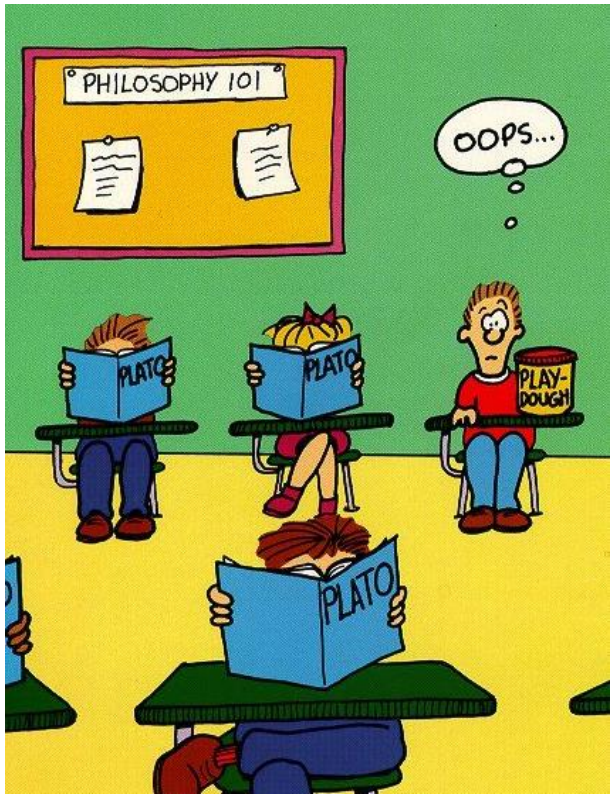
Teachers' perspectives

- Teachers are the '*vanguards of school-university/ industry partnerships'* (Aslam *et al.* 2018)
- Semi-structured interviews conducted with nine visiting teachers during the 2017/18 academic year
- All teachers from, long-term, London school partner (FSM= 30.3%)
- Interviews transcribed and coded in NVivo 11
- Codes chosen *a priori* from science capital literature



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Key findings #1

- Rejection of curricular outcomes
- *"…to come into a university and see the process of experimenting to actually find a relationship and then testing it … I think that really gets to the heart of science,* ***so it's not really content****, it's more 'how is scientific knowledge generated'"*- T7
- Given the importance of curricular knowledge for gaining institutional capital (i.e. qualifications), these results were somewhat surprising.
- Teachers' opinions were often grounded in criticism of 'school science' and the pressures of formal qualifications

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Key findings #2

- Importance of access to science equipment
- *"… we don't have the equipment, so we couldn't do it* [PCR and electrophoresis] *and that's something cool for them to do, which they would only get to do once they got to university."*- T2
- There is not enough funding to warrant buying a class sets of some specialist equipment.
- However, these science artefacts are valuable *objectified science capital* in the scientific community.
- Outreach helps increase students' contact to objects which have scientific cultural value.

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Key findings #3

- Exposure to the everyday scientific practices of the science community
- *"…you want to give them a chance to see and understand a relatively normal day, like how going in to do a lab with your biology cohort might be if you are on a day at uni. and you are in the labs"*- T8
- Science in novel environments has been found to be disorientating or exclusionary to newcomers (Archer *et al.* 2016)
- School/university outreach provides a less-threatening environment, where school social norms mediate extent of unknown social expectations
- Students are passively exposed to the tacit scientific attitudes and values so they can develop their stock of *embodied science capital*.

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Summary

- Teachers want students to have an *authentic* experience.
- Outreach should not try to replicate school- qualifications are important, but formal institutions specialise in developing students' stock of institutional capital.
- Teachers value when outreach is situated within socio-cultural context (both university and specific domains)
- An authentic context allows students to access valuable forms of objectified capital.
- Finally, teachers value the access to tacit forms of knowledge which allows the development of students' embodied cultural capital