Imperial College London







Science and Technology Facilities Council

Going beyond the one-off

How can STEM engagement programmes with young people have real lasting impact?

Martin Archer (m.archer10@imperial.ac.uk), Jennifer DeWitt, Carol Davenport, Olivia Keenan, Lorraine Coghill, Anna Christodoulou, Samantha Durbin, Heather Campbell, and Lewis Hou

Read our review paper https://doi.org/10.14324/RFA.05.1.07

Imperial College Science capital & aspirations

STEM engagement focuses most often on school students (<u>Hamlyn+, 2015</u>)

"Raising aspirations" is often a major focus

BUT aspirations are complicated:

- Multifaceted and naturally evolve
- Tied to built-up identity
- Affected by background factors

Led to the concept of "science capital" by <u>ASPIRES team (L. Archer & DeWitt, 2017)</u>



Imperial College London Outreach interventions

ONE DOES NOT SIMPLY

HAVE LASTING IMPACT ON ASPIRATIONS BY GIVING A TALK

Most interventions are "**one-offs**" i.e. a talk, workshop, show, visit.

These necessary have limitations – we all need to be more realistic about their possible outcomes!

We have reviewed the evidencebase for emerging approaches of going beyond the one-off

Can they have lasting impact?

Warner Bros

Imperial College London How much influence?

Consider "learning ecology" of young person – context in which learning takes place since outreach / engagement do not occur in isolation

Scientists delivering one-off activities are far out in the learning ecology



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Two complementary approaches to increasing our influence through the learning ecology:

1. Repeated-interventions

2. Influencing the influencers



Imperial College Realistic impacts by type of programme

| What? | Who? | Potential impact(s) |
|---|-----------------------------------|---|
| One-offs | Young person | Learn 'factoids' Awareness of careers Support interest STEM Aspirations |
| Short series (repeat-interventions only) | Young person | Awareness of careers Support interest Perceptions of scientists Confidence STEM Aspirations |
| Deeper programmes (repeat-interventions AND influencing the infuencers) | Young person Teacher Family | Confidence & skills Attainment STEM Aspirations Degree destinations |

See review paper for full details of evidence

https://doi.org/10.14324/RFA.05.1.07

Imperial College How can I maximise my impact?

Whether one-offs or repeat interventions – we recommend:

1. Tailor purpose to the context of students' educational journey (based on current research)



Davenport+ (2020)



Science Museum

Royal Institution

2. Consider what **you** are best placed to deliver compared to the rest of the STEM communication / engagement sector (researchers, freelancers, museums etc.)

3. Adopt a theory of change approach to designing your programmes

Imperial College London Theory of Change

Pathway from intervention(s) to long-term impact

Work backwards

Evidence-based

Complex!

If too daunting try the <u>"Who? What? Why?</u> <u>Where? When? And How?"</u> <u>approach</u> first



Example TOC from M.O. Archer+ (2021, GC)

Imperial College Conclusions

One-offs and short series do not appear to have the long-term impacts on aspirations that we are often hoping to achieve.

Deeper programmes of engagement are required, based around theories of change and considering young people's wider learning ecology.



Find out more in our full review paper https://doi.org/10.14324/RFA.05.1.07