NERUPI network
Evaluating & Researching University Participation Interventions

Mapping STEM outreach practices: Summary Report

Introduction

This report outlines findings from the Science Technology Engineering and Maths (STEM) outreach mapping exercise undertaken by NERUPI STEM Working Group member HEIs in 2025-26 reflecting on the academic year 2024-25.

At the end of the academic year 2024-25 the NERUPI STEM working group decided it would be helpful to map out outreach activity across member HEIs. The aims of this mapping activity were to share practice, understand current approaches and to identify patterns in approaches taken. The group was interested to explore: types of activities; subject disciplines covered; age groups HEIs were working with; target groups; how students were identified for participation; the location of activities; and how practices related to APP plans. A form was designed and uploaded to the NERUPI STEM working group website page and members invited to complete the form. In total nine HEIs from the STEM working group completed this. This group included HEIs from the Russell group, Plate Glass Universities and The MIllionPlus Group.

Please note, this report is indicative of patterns of outreach activity and does not aim to provide an accurate or detailed analysis. A limitation to the information collated here is that STEM outreach in HEIs is often complex and distributed across different areas so individuals completing the form were not always able to provide a full account of activities. A further limitation is that information was inconsistent across HEIs (with some providing more detail) so there are gaps/inaccuracies in the detail presented.

Outreach practices

Types of activities

A wide range of activities were described. Accounts indicated that most HEIs planned some longitudinal outreach activities, working with targeted groups of school students over a significant time period; reflecting findings indicating such approaches are more impactful than single events (Macdonald, 2014).

A number of activities outlined, focused on attainment raising. Many of these attainment raising activities worked with groups over extended time periods, notably with pre 16 school aged students (KS3-4) in science, technology and maths, with activities sometimes including primary aged students.

Providing access to mobile science labs enabling them to bring specialist equipment and expertise to schools	KS2 & KS3
Focused work with KS3 students to raise attainment in Maths with one institution focused on working with students to support Maths attainment as they transition from Primary to Secondary school.	KS2 &KS3
Saturday clubs	KS4
Access to Labs to support science teaching and Science practicals with students	KS4 &5
Maths and Further Maths tutoring	KS5

A large number of activities focused on developing students' knowledge of particular subject disciplines and aimed to increase awareness of progression routes into HE/ careers. Medicine was sometimes included as part of the STEM offer – with STEMM used by one institution (though this was not the case in most institutions). Some activities were longitudinal whereas others such as taster days and academic talks, were one off events.

Workshops and assemblies	KS2
Taster days and campus visits	KS4&5
Subject experience weeks	KS5
Saturday and homework clubs	KS4
Summer Schools	KS4&5
Academic talks	KS4&5
Challenges (e.g. Maker Challenge Programmes)	KS3 & KS4

Age groups

Most contributing HEIs described working across several year groups with some institutions working across primary age groups and all year groups in secondary schools. Unsurprisingly, significant activity was focused on Sixth Form/ College students and Year 9/10 students. The more limited focus on Year 11 is unsurprising due to schools restricting work with these groups due to GCSE exams. What is perhaps more surprising is that HEIs were working more with Primary schools than Years 7 and 8. This focus on primary aged students may be in response to an increased awareness about how early identities in relation to STEM subjects are formed (Archer, DeWitt, Osbourne, Dillon, Willis & Wong, 2010).

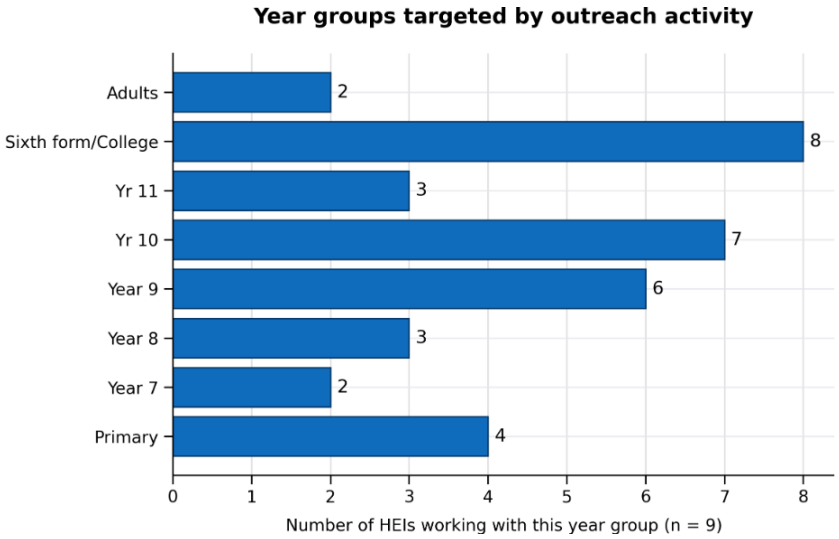
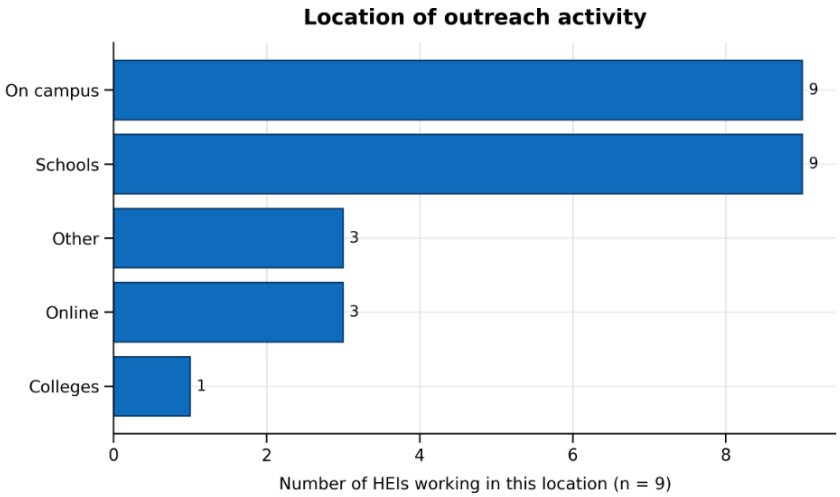


Figure 1. STEM outreach activity by year group

Location of activities

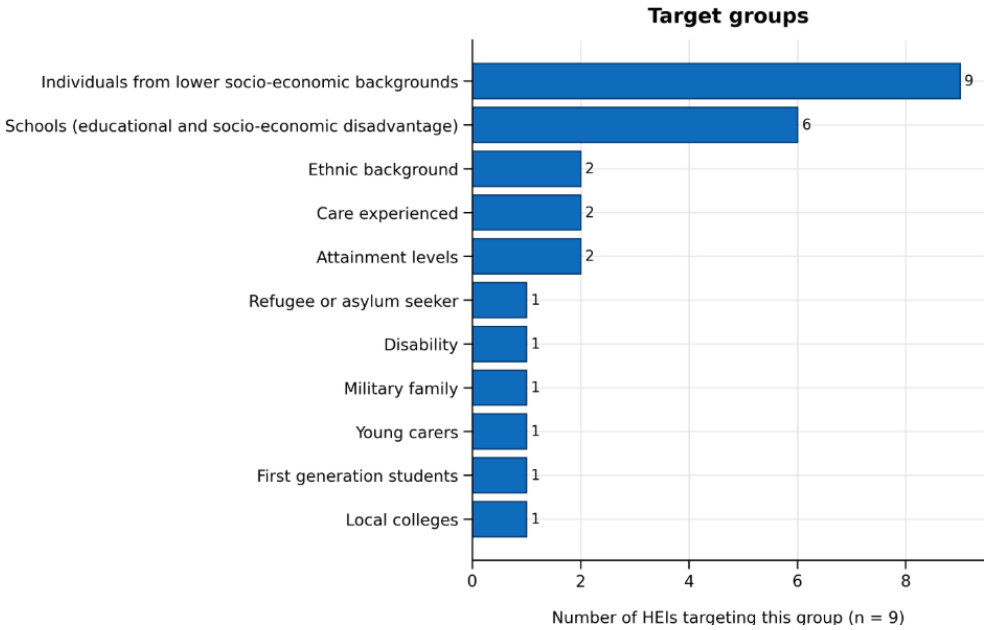
All participating HEIs outlined outreach activities taking place in schools and on campus. Several noted that the majority of outreach undertaken takes place on campus with one commenting on the importance of being on campus and providing younger students with the experience of being on campus and seeing/using HE facilities. A few HEIs described working online or hybrid with school aged students such as providing maths tutoring. Some HEIs were also engaging with students at other locations such as hospitals, museums and theatres. Only one institution noted working with college

students, reflecting research that indicates the limited engagement of HEIs with colleges (particularly FE) (Gartland & Smith,2018; Baker, 2020; Raven, 2022).



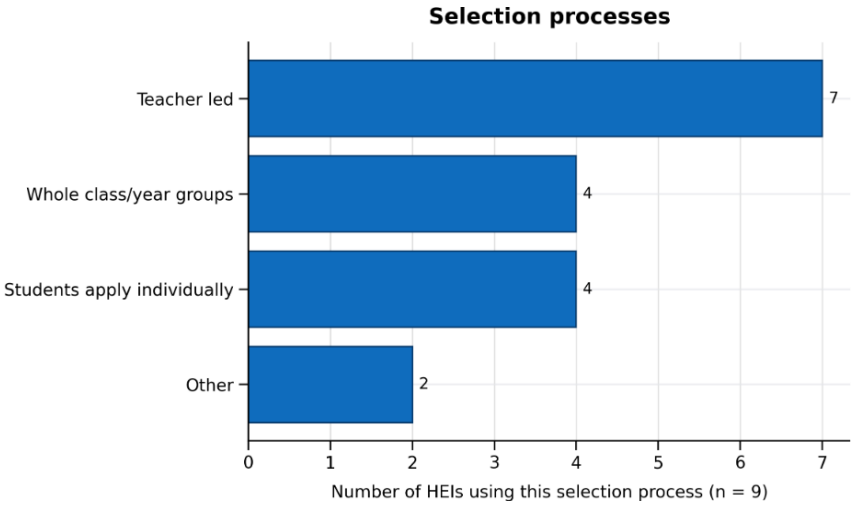
Targeting Practices

All HEIs contributing to the survey noted targeting students from Low Socio-Economic Backgrounds (LSE). Measures used to identify these students included students on free school meals, pupil premium students and students living in areas classified within Index of Multiple Deprivation (IMD) Quintiles 1 or 2. Schools were also targeted based on indicators of educational and socio-economic disadvantage, including Tracking Underrepresentation by Area (TUNDRA), Participation of Local Areas (POLAR), the Index of Multiple Deprivation (IMD), Free School Meal (FSM) eligibility, and household income measures. A number of specific target groups were also noted by individual HEIs from the Office for Student's Equality of Opportunity Risk Register (EORR).



Selection Processes

Following identification of schools (based on locality in relation to HEIs and/or indicators of deprivation/ numbers of students at schools based on relevant background characteristics) in most instances students were selected for outreach activities by teachers. Teachers were either tasked by HEIs with selecting students based on relevant background characteristics (e.g. free school meal, care experienced etc.) or identifying students studying/ interested in particular subject disciplines and/or students they felt would benefit from outreach activity. Some activity, including taster days and some primary school activities engaged with whole year groups. There were also several programmes where students applied to attend themselves either directly to HEIs or via teachers in schools.



The influence of Access and Participation Plans (APP)

Information provided indicated that APPs were often focused on attainment raising in response to the Office for Students (OfS) explicit encouragement for HEIs to contribute to raising pre-16 attainment to help address inequalities HE access. Accounts indicated a focus on raising attainment in Maths (e.g. through Maths tuition) and raising attainment in Science by supporting practical Science experiments/ access to science laboratories in relation to APP. The OfS guidance on partnerships (with schools, colleges, community and third sector) and building collaborative approaches to raise Pre 16 student attainment was also reflected in descriptions of APP. Participating HEIs were often working in collaboration (e.g. with NHS Foundation Trust, Maths Excellence Fund partnership, Pimlico Connection Tutoring).

Points for consideration

How will the increased OfS focus on regional, cross-sector collaboration influence future activities?

- Will more regionally planned outreach enable increased focus on KS2-KS3?
- Will a regional focus support cross-sector collaboration?
- Can FE colleges be included in collaborations?
- Will attainment raising activities continue?

References

Archer, L., DeWitt, J., Osborne, J., Dillon, J., Willis, B., & Wong, B. (2010). "Doing science versus being a scientist: Examining 10/11-year-old schoolchildren's constructions of science through the lens of identity." *Science Education*, 94(4), 617-639.

Z. Baker (2020) The vocational/academic divide in widening participation: the higher education decision making of further education students, *Journal of Further and Higher Education,* 44:6, 766-780

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