Nuffield Foundation

Evaluation of the Science Bursaries for Schools & Colleges Programme

Final Report

January 2013

We asked Nuffield students to describe science in three words:

"Lots of experiments"

"Fun but difficult" *"Explanation, knowledge, description"*

"Intriguing, factual, challenging"

"Exciting, new, engaging" *"It is beautiful"*

"Pushing the boundaries"

"Really cool toys" *"Future of everything"*

"Interesting, fun, innovative"

"Solving hard equations" *"Labs, fieldwork, research"*

Evaluation Services

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Executive Summary

Introduction

In 2012, the Nuffield Foundation commissioned Matthew Terry and associates (now Cloud Chamber Limited) to evaluate the Foundation's Science Bursaries for Schools and Colleges Programme. The programme provides over 1,000 bursaries annually for Year 12 students in their first year of a post-16 Science, Technology, Engineering or Maths (STEM) course. Students get to work alongside practising scientists during the summer holidays, giving them an insight into the world of scientific research and development.

The overarching objectives of the evaluation were to understand:

- The barriers and drivers for taking up a bursary placement, and what changes may be required to facilitate the opportunity for all eligible students (the programme having sought to increase participation from students with disadvantaged backgrounds in 2011/12).
- The short and long term impact of the programme in terms of students' aspirations; their understanding of what scientific research involves; their actions; and HE/career outcomes.
- How the Nuffield Foundation can add value to the programme, both for individual students and their institutions.

The evaluation was conducted using a multi-method approach. The specific research tasks completed for the evaluation were as follows:

- Telephone interviews with 17 of the programme's 21 regional coordinators.
- Three online surveys of students: pre- and post-placement surveys of successful applicants; and a survey of unsuccessful applicants.
- Fieldwork in six programme regions including pre- and post-placement focus groups with participating students; placement observations; and interviews with project providers.
- A review of relevant programme documentation and data provided by the Nuffield Foundation.

Progress in improving the programme's social balance

In 2011, the Nuffield Foundation decided to shift the socio-economic balance of the programme so that it more accurately replicated the A level student population as a whole. Targets were set to help the programme's regional co-ordinators to identify and engage schools in more deprived areas.

After one year of the new targeting system, the programme's socio-economic balance has noticeably improved, as measured by the programme's targets. The programme's regional coordinators have successfully engaged a greater number of schools from the country's most deprived areas. This encouraging picture is also reflected in the socio-economic profile of the programme's successful applicants, and survey evidence suggests that the programme is bringing in a good proportion of students who are entitled to educational financial support and/or who are the first generation in their family to consider higher education.

The programme experience

Students from disadvantaged backgrounds do not seem to be adversely affected by how they hear about the programme. Teachers are by far the most significant source of information, regardless of school or individual background, and so it is sensible that regional coordinators put much of their effort into engaging with these professionals. The programme's efforts to seek links with other enrichment and widening participation initiatives (Reaching Opportunities, HEAPS, etc.) also seem appropriate as these are proportionately more important sources of information for disadvantaged students.

Work experience is the most popular reason why students apply to the programme - irrespective of their background – followed by improving their chances to get into university and curiosity about science. In terms of how the programme is marketed to students, this suggests that the same messages are broadly working for all individuals, regardless of background.

Students from disadvantaged backgrounds appear less likely to be encouraged by others to apply to the programme, suggesting that they generally receive lower levels of support in putting themselves forward for such opportunities. This is something that ementoring may be able to address in due course.

All programme students were eligible for an £80 a week bursary payment during their placement. Students from disadvantaged backgrounds (as measured by entitlement to education-related financial support) viewed the bursary payment as a more important factor in their decision to apply than other students; and a greater proportion found that the financial help had been more critical to their completing the programme in hindsight. As the programme develops in the coming year, it will be important to ensure that marketing messages continue to stress the availability of financial support to those who will need it.

The overall experience for bursary students remains an overwhelmingly positive one, according to the students themselves, and suggestions for improvement are minor. Coordinators already make significant efforts to place students in the most appropriate placements possible given the circumstances of limited placement providers and a wide variety of student expectations.

Programme impact on students

The programme has a marked impact on participants' views of science. They acquire a much better understanding of what it means to be a scientist on a day-to-day basis, and students from disadvantaged backgrounds in particular are made more aware of the range of job opportunities available within STEM subjects. Although their stated enjoyment of science and interest in it as a career doesn't alter materially (it remains at a high level from before their placements begin), participants also learn important lessons about how to conduct scientific research: the need for precision, for repetition, and for creative thinking.

Evidence of impact on students' learning and skills development is less clear from the evaluation's quantitative work, although there are many positive stories at the individual level and some small signs that the programme has a more immediate (albeit small) positive impact on students from disadvantaged backgrounds. This lack of evidence may be due to the timing of the research: skills and knowledge development can take time to become embedded following training or a similar intervention. We might therefore expect participants to become more aware of the programme's

benefits in this area some time after it has concluded, for example when they reach university. The Nuffield Foundation is considering how best to capture this longer term impact through greater engagement with the programme's alumni.

The programme evidently attracts students who are already very keen about science, and who are already actively considering it as a future study option. It is therefore not surprising that, for nearly two-thirds of participants, the placement experience helps to confirm their original study plans. Nine out of ten participants thought that the programme had been some sort of influence on their future studies.

Early lessons from the mentoring pilot

When deciding to shift the demographic balance of the bursaries programme, the Nuffield Foundation recognised that students from more deprived backgrounds might require additional support, both to apply to the programme and to successfully complete and benefit from their placements. It was therefore decided to pilot a mentoring scheme, matching disadvantaged students with experienced individuals in STEM subjects, such as researchers and STEM ambassadors. The pilot is run with the Brightside Trust, who provide an 'ementoring' system that allows mentoring to take place in a safe, secure online space. To date, the pilot has been limited in size and mentoring relationships take time to develop. Further information on the evaluation of the mentoring pilot will be reported at a later date.

Conclusions

The Nuffield Foundation and its regional coordinators have made positive steps towards improving the socio-economic balance of the bursary programme. The targeting approach has worked well in general, and has increased the numbers of participants from disadvantaged backgrounds. A similar performance next year should bring the programme to within reach of its two year target. To deliver that, the programme needs to be mindful of the following:

- Regional coordinators will need to reduce the number of placements available to the least disadvantaged state schools.
- Regions with grammar school systems may need to rely more on individual measures of disadvantage if they are to reflect local patterns of deprivation more closely.
- The system of setting bursary targets for FE colleges requires review, in consultation with regional coordinators.

The programme remains an enormously positive experience for the vast majority of its participants. Encouragingly, this seems unchanged in the face of its shifting socio-economic profile. Students of all backgrounds apply to the programme for very similar reasons, although disadvantaged students are less likely to be encouraged by others to apply. Additional encouragement for these students may be provided through the following:

- Using the new mentoring scheme to help motivate students to apply to the bursary programme.
- Using multiple channels to reach students and inform them about the programme, including enrichment activities and direct contact.

- Reinforcing messages about the availability of financial support in marketing materials and activities.

Participants learn a huge amount through their placement experiences about science; themselves; and their future options. Evidence of skills development is rather limited, so consideration should be given as to how the longer term impact of the programme on participants' skills development might be monitored. To an extent this is already being done with the Nuffield Foundation seeking much greater engagement with the programme's alumni.

There is some limited evidence that students from disadvantaged backgrounds may get slightly more benefit from the programme in some areas, for example increased awareness of science job opportunities; greater improvements in report-writing and time management skills; and more help with making decisions about their future studies. This provides further reinforcement – should any be required – that shifting the programme's socio-economic balance was a sensible way of increasing its impact.

As this evaluation draws to an end, the Nuffield Foundation is already redeveloping the bursary programme, both in terms of how it incentivises coordinators to target greater numbers of disadvantaged students, and how it might fit into a wider strategy of supporting STEM enrichment among school-age children and young people.

The last year of the programme has seen substantial programme changes through the introduction of the targeting approach and the piloting of the mentoring scheme: substantial in their own right, and perhaps more so because the programme had previously been relatively unchanged for many years. It has therefore helpfully shifted mindsets in two directions: first, by making a clear case for encouraging more participation among students from deprived backgrounds, which has been widely accepted as a positive step; and secondly, to emphasise that the programme should continue to grow and develop as necessary to meet its ultimate aims.

As the programme continues to evolve, it will be important that it manages to deliver change while retaining the many elements of the programme that make it such a successful and positive experience for its participants, something that has been successfully achieved over the past 12 months.