An Evaluation of Phase 3 of Explore Your Universe

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March 2018

UK Association for Science and Discovery Centres

Science & Technology Facilities Council

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Executive Summary

This report provides an evaluation of Phase 3 of Explore Your Universe (EYU) which commenced in April 2016. In total, 39,273 people participated in events in 14 science and discovery centres. The evaluation draws on response from 213 teachers and 4,282 students.

Feedback from both students and teachers was very positive with, for example, 98% of the 129 teachers surveyed reporting that they would recommend the activities to colleagues. Boys and girls were equally positive about the activities with some slight differences for some aspects. Students from schools in areas of higher deprivation were slightly more positive about the activities than students from schools in areas of lower deprivation although both groups were overwhelmingly positive. Almost four out of five students found the activities inspiring. Significant numbers of students reported that they were more likely to consider a career in STEM after taking part.

The main findings are as follows:

1. Of the students whose schools had received bursaries to participate in events, 89% rated the EYU activities as 'Very Good' or 'Good'. Primary school students (92%) were more positive than secondary school students (87%).

2. Students from schools in areas of higher deprivation (91%) were slightly more positive about the activities than students from schools in areas of lower deprivation (88%).

3. In total, 79% of students felt inspired by the activities. More primary school students (87%) were inspired than secondary school students (75%).

4. More students from schools in areas of higher deprivation (83%) were inspired than students from schools in areas of lower deprivation (80%).

5. Three-quarters of students said that they would tell friends and family about the activities with female students being more positive, especially those from primary schools.

6. More than half the students reported that they had never used the equipment in the activities before.

7. Most students (60%) reported that they thought the activities would be useful for their science classes. Primary students were more positive about this aspect than secondary students, and, particularly, primary students from more deprived schools.

8. More than half the students were more likely to consider a career in STEM after taking part in the activities (53%). The likelihood was greater for primary than secondary students. Similarly, male students were more encouraged by the activities than were female students.

9. Half of the students reported that they knew about the type of research described being carried out in UK. However, secondary students were more aware than primary students, and among secondary students, males claimed to be more informed.

10. The evaluations from students who took part in careers events run by two centres were equally positive (n=353 students). Most of the participating students positively evaluated the overall activity (91%). Primary students were significantly more positive about the activity than secondary students. Similarly, female students were more positive than male students, and students who attended more deprived schools were more positive about the activity than students who attended less deprived schools.

11. Ten centres organised outreach activities and reached 9,171 participants. Most students gave a positive evaluation of the overall activity (85%). Primary students were significantly more positive about the activity than secondary students. Similarly, primary female students were more positive than male students, and primary students who attended more deprived schools were more positive about the activity than students who attended less deprived primary schools.

12. Students valued the interactivity of the activities and reported learning something new. Students liked the hands-on nature of the activities and enjoyed using sometimes novel equipment.

13. A total of 129 teachers participated in the evaluation for these activities from nine centres. Overall, 93% of the teachers gave a positive evaluation of the activities. And almost all teachers (98%) would recommend these activities to other teachers.

14. The funding for visiting the centre was crucial for teachers; if the cost is covered then over 90% of teachers reported that they would take students to a science centre or arrange an outreach visit. With no cost cover this percentage dropped to 30% and 43%, respectively.

15. The content of the workshops, the scientific equipment and the expertise of the centre staff were uniformly evaluated very positively. The content and the equipment were slightly better evaluated by teachers who were visited by a centre (outreach) than by teachers who visited a centre. Teachers from more deprived schools were more positive about the content and the expertise of staff than those who work in less deprived schools.

16. Most teachers (77%) reported that they would talk with their students about the EYU content in the future. Two-thirds of the teachers reported that they were interested in attending CPD on this topic.

17. Most of the teachers did not know about STFC before the activity (88%).

18. Interviews with staff from the 14 participating centres found very high levels of enthusiasm for EYU project. Centres felt part of a national project that was well supported by ASDC and STFC. Whether or not centres had been involved in designing and writing the activities, there was high praise for what had been provided.

19. All centres benefitted substantially from the funding which allowed them to engage with new schools or to strengthen existing relationships. Some centres had identified strategies to ensure that these links could be maintained after the project finished. Many centres seem to have benefitted

from a focus on outreach to schools and, in one case, to a prison. Centre staff felt more confident in delivering EYU-type activities beyond their own institution.

20. The kit was uniformly valued as one of the major legacies of the project particularly as there are few consumables to be replenished. Particularly popular parts of the kit were the heat-sensitive camera, the Van der Graaf generator and the emission tubes.

21. All respondents reported enthusiastic responses from students. Some thought that this response was identical between boys and girls however some respondents thought otherwise. Some respondents reported that girls were more engaged and able to interact with presenters and visiting scientists; other respondents thought that 'science is for boys' was a stereotype displayed by students and, more worryingly, by accompanying adults.

22. The centre staff presented a picture of the UK schooling system that was worrying. Inadequate funding for travel, poor classroom resources and teacher shortages were mentioned. Weak teacher knowledge of science topics was also raised as an issue. These perceptions only reinforce the value of science and discovery centres in the science education of young people.

1. Introduction

Explore Your Universe (EYU) is a national programme celebrating the physical sciences developed by the UK Association for Science and Discovery Centres (ASDC) in partnership with the Science and Technology Facilities Council (STFC). EYU began in 2012 and in the first year of Phase 1, 156,880 children and adults took part in events at 10 science and discovery centres and two STFC facilities. Phase 2, which began in 2014, saw 184,834 visitors taking part in events at 10 more centres. Phase 3 started in April 2016 and this report describes the evaluation and its findings.

The Vision of Phase 3 was as follows:

> *'To increase the value-for-money, sustainability and legacy of the Explore Your Universe Programme, further extending the reach into disadvantaged and underserved schools and communities to engage those who are remote from STEM (including geographically) whilst inspiring a sense of excitement around the physical sciences with young people and families, through sharing the amazing stories and technologies of STFC.'*

Participating centres chose to organise outreach events involving visits to schools or other locations and/or careers events involving local and national employers. Some centres chose to provide bursaries so that schools could take part in events that they would not normally have been able to afford.

More than 39,000 people participated in different activities in Phase 3. Table 1 shows the the total number of participants by centre and by activity:

Table 1. Numbers of participants for each science and discovery centre (n=14 centres)

	Students			Teachers				People			
Science centre	Outreach	Bursary	Schools Careers Events*	Outreach	Bursary	Schools Careers Events*	Teacher CPD	Families or Communities	Careers Events	Other EYU activities	Total
Aberdeen Science Centre	1631	1257	0	20	83	0	0	18944	0	18	21953
Cambridge Science Centre	918	0	0	77	0	0	0	970	0	100	2065
Catalyst Science Discovery Centre	160	440	452	8	60	39	0	0	0	431	1590
Dundee Science Centre	1439	0	0	68	0	0	0	125	0	0	1632
Dynamic Earth	0	0	0	0	0	0	0	600	1100*	536	2236
Glasgow Science Centre	0	0	0	0	0	0	0	0	620**	0	620
Jodrell Bank Discovery Centre	1532	587	0	47	17	0	0	0	0	0	2183
National Space Centre	0	0	0	0	0	0	14	18	0	0	32
Observatory Science Centre	767	0	0	26	0	0	0	0	0	0	793
Science Oxford	0	0	0	0	0	0	110	150	180**	0	440
Techniquest	0	1287	0	0	10	0	0	0	0	0	1297
Techniquest Glyndwr	346	255	0	20	20	0	0	961	167**	30	1799
W5	668	259	0	26	12	0	0	0	0	0	965
Winchester Science Centre	1375	0	0	43	0	0	0	0	0	250	1668
Total	**8836**	**4085**	**452**	**335**	**202**	**39**	**124**	**21768**	**2067**	**1365**	**39273**

* Schools and public audience

** Schools audience

2. Evaluation of the programme

The overarching purpose of the evaluation was to assess the programme's impact and success. The evaluation was also designed to provide information to partners to help them to reflect on their experiences and, thus, inform any future initiatives.

2.1 Evaluation data collection

The evaluation consisted of a series of standardised evaluation forms and telephone interviews with staff at the participating centres (see Appendix 3). A short evaluation form was designed for students who participated in the activities. This form was given to three different groups of students: Bursary students, Outreach students and Career Event students. Two evaluation forms were designed for teachers; one corresponds to the evaluation of a continuing professional development activity (Teacher CPD questionnaire) and the other targeted the teachers who attended the activities with their classes (School Event Teacher questionnaire).

Participating centres were asked to ensure that the evaluation forms were completed by a minimum number of students and teachers taking part in the project activities. Centres were asked to allocate appropriate time for participants to complete the forms. Responses from the paper evaluation forms were entered by volunteers and staff at each centre into an online survey database.

2.2 Methodology of analysis

2.2.1 Evaluation forms or questionnaires:

Each questionnaire includes multiple-choice questions and open-ended questions. Quantitative analysis was used to examine the responses between different groups who took part in the evaluation. Specifically, differences in the responses between primary and secondary students; between genders, and between students who attended from more deprived schools[1] and less deprived schools[2] were tested. Due to the characteristics of the data, the main test that was conducted in order to find whether there were any significant differences between groups was the t-test (see page 16 for an explanation of this method). Descriptive statistics for the respondent group and the responses are also provided for each question.

The analysis of the open-ended questions followed a more holistic approach. Thematic analysis was used to recover the main themes for each question. These were then compared across similar questionnaires (Bursary, Career event and Outreach). Major differences within the responses among these questionnaires are explicitly highlighted. The teachers' open-ended questions were also analysed using thematic analysis. Within each teacher evaluation form (School and Career event, Teacher questionnaire and Teacher CPD questionnaire) each question was analysed independently.

2.2.2 Telephone interviews:

Each centre was asked to nominate a member of staff to take part in a Skype or telephone call with one of the evaluation team (JD). Participants were given a list of discussion topics in advance and

[1] The Index of Multiple Deprivation (IMD) was used to classified schools by their postcode. The most deprived schools are located in areas within the first quintile of the IMD (lower IMD).

[2] The Index of Multiple Deprivation (IMD) was used to classified schools according its postcode. The least deprived schools were located in areas within the fifth quintile of the IMD (higher IMD).

calls lasted between 30 minutes and an hour. The interviews were audio-recorded and independently transcribed. Participants were offered the chance to receive a copy of the transcript if they so wished.

3. Results

3.1 Evaluation programme targets and actual number of participants

The final sample required for the evaluation forms within each centre is shown in the Table 2:

Table 2. Target number of surveys required from each centre (n=14)

	Final Sample size required								
	Outreach		Bursary		Careers / Other			CPD	
Centre	Primary	Secondary	Primary	Secondary	Teacher	Student	Public	Teacher	Total
Aberdeen Science Centre	120		120						240
Cambridge Science Centre	150	60							210
Catalyst Science Discovery Centre	120		120						240
Dundee Science Centre		210							210
Dynamic Earth (two day careers event)						180	30		210
Glasgow Science Centre (three day careers event)					*	*			210
Jodrell Bank Discovery Centre		30		180					210
National Space Centre (prisoners)							*	*	**
Science Oxford (Holiday Clubs)		*			*	*	*	*	210
Techniquest			270						270
Techniquest Glyndwr		90		120					210
The Observatory Science Centre	210								210
W5		30		180					210
Winchester Science Centre		210							210
Total	600	630	510	480		180	30		2850

** no strict constraint of 210 evaluations

The overall number of responses to the surveys was achieved. However, the distribution of these responses varies from the original requirement. Table 3 summarises the number of responses that each centre submitted for the programme evaluation.

Table 3. Actual number of surveys returned by each centre (n=14)

Science Centre	Bursary Student Questionnaire	Careers Event Questionnaire	Outreach Student Questionnaire	School and Career Events Teacher Questionnaire	Teacher CPD Questionnaire	Total Responses
Aberdeen Science Centre	160	0	996	13	0	1169
Cambridge Science Centre	0	0	299	39	0	338
Catalyst Science Discovery Centre	213	0	122	0	0	335
Dundee Science Centre	0	0	530	6	0	536
Dynamic Earth	0	124	0	3	0	127
Glasgow Science Centre	0	229	0	0	22	251
Jodrell Bank Discovery Centre	173	0	52	0	0	225
National Space Centre *	0	0	0	0	14	14
Science Oxford	0	0	25	0	48	73
Techniquest	0	0	281	10	0	291
Techniquest Glyndwr	232	0	58	23	0	313
The Observatory Science Centre	0	0	333	21	0	354
W5	181	0	103	8	0	292
Winchester Science Centre	0	0	171	6	0	177
Total	**959**	**353**	**2970**	**129**	**84**	**4495**

3.2 Results

Three questionnaires were developed for collecting students' opinions on whichever type of activity they took part in. Centres returned responses from 4,282 students with some centres returning far more than was requested. In order to have adequate representation for each centre, 2,542 responses were randomly chosen to be analysed. Thus, for each questionnaire, the numbers of responses from females and males are similar. The number of responses from students who attended from more deprived schools (lower IMD) is greater than responses from students who attended from less deprived schools (higher IMD). This difference is because the focus of this phase of EYU was on schools that might not normally take part in such events. The quantitative analysis of the student questionnaires can be found in Appendix 1, followed by the qualitative analysis.

Two evaluation forms were developed for collecting teachers' opinions. Centres provided responses from 213 teachers. The quantitative analysis of the responses focuses on the differences between the two groups of teachers - those who work in more deprived schools (lower IMD) and those who work in less deprived schools (higher IMD). For each questionnaire, the number of responses from teachers who work in more deprived schools and those who work in less deprived ones can be significant and, therefore, a statistical test was not always possible. Nevertheless, descriptive statistics are always offered. These analyses can be found in Appendix 2, followed by a qualitative analysis.

3.3 Findings from the student evaluation forms

3.3.1 Findings from the Bursary Student Questionnaire

A total of 959 students participated in the workshop evaluation from five centres. A detail of the results can be found in Appendix 1**: Students' Questionnaires**. Findings from the quantitative analysis of this questionnaire include:

- Most students were positive about the overall activity (88%). Primary students were significantly more positive about the activity than secondary students. Similarly, students who attended less deprived schools were more positive about the activity than students who attended more deprived schools;
- Most students reported that they were made to feel welcome (93%) and inspired by the activity (79%). Again, primary students were significantly more positive than secondary students. Similarly, the majority of students reported that they could join in and be part of the activities (87%). However, in this case, secondary students felt more able to join in than did primary students. Likewise, students from less deprived schools felt more positive about their ability to join in than students from more deprived schools. These data suggest that children attending less deprived schools may be more accustomed to science engagement activities;
- Most students said that they would tell friends and family about the activities (75%). Female students were more positive, especially those from primary schools;
- More than half the students reported that they had never used the equipment in the activities before;
- Most students reported that they thought the activities would be useful for their science classes (60%). Primary students were more positive about this aspect than secondary students, and, particularly, primary students from more deprived schools;

- The activities promoted interest in STEM subjects in 59% of students. This encouragement was greater for primary students and for males (especially for those in secondary school);
- Most students were more likely to consider a career in STEM after taking part in the activities (53%). This likelihood is greater for primary than secondary students. Similarly, male students were more encouraged by the activity than were the female students;
- Half of the students reported that they knew about the type of research described being carried out in UK. However, secondary students were more aware than primary students, and among secondary students, males claimed being more informed.

3.3.2 Findings from the Career–Event Student Questionnaire

Two centres returned responses from their career-event workshops (n=353 students) (see Appendix 1**: Students' Questionnaires**). Findings from the quantitative analysis of this questionnaire include:

- Most students positively evaluated the overall activity (91%). Primary students were significantly more positive about the activity than secondary students. Similarly, female students were more positive than male students, and students who attended more deprived schools were more positive about the activity than students who attended less deprived schools;
- Most students reported that they felt welcomed in the activity (95%) and inspired by it (79%). Secondary female students were specifically more positive in these aspects. Similarly, the majority of students reported that they could join in and be part of the activities (93%). However, in this case, primary students felt more able to join in and be part of the activity than secondary students. Likewise, students from more deprived schools felt more positive about their ability to join in than students from less deprived schools. Additionally, female secondary students were more positive in this aspect than were male secondary students;
- Most students reported that they would tell friends and family about these activities (82%). Primary students were more positive than secondary students in this respect;
- Most students reported that they had never used the equipment in the activities before (82%).
- Most students reported that they thought the activities would be useful for their science classes (58%). Students from more deprived schools were more positive about the usefulness of these activities than those who attended less deprived schools;
- The activities promoted interest in choosing a STEM subject in the future (62% of students);
- Most students were more likely to consider a career in STEM due to the activities (60%). This likelihood increased more for secondary students who attended more deprived schools than those who attended less deprived schools;
- Half of the students reported that they knew about this type of research being carried out in UK. However, secondary students were more aware than primary students.

3.3.3 Findings from the Outreach Student Questionnaire

A total of 1,230 student responses from 10 centres were used in the evaluation. Details of the results can be found in Appendix 1**: Students' Questionnaires**. Findings from the quantitative analysis of this questionnaire include:

- Most students gave a positive evaluation of the overall activity (85%). Primary students were significantly more positive about the activity than secondary students. Similarly, primary female students were more positive than male students, and primary students who attended more deprived schools were more positive about the activity than students who attended less deprived primary schools;
- Most students reported that they felt welcomed by the activity (88%) and inspired by it (74%). Primary students were more positive about these aspects than secondary students. Within secondary students, female students and those who attended more derived schools were slightly less inspired by the activity. Overall, the majority of students reported that they could join in and be part of the activities (68%) with primary students being more positive about this aspect than secondary students. In particular, female primary students felt more positive about their ability to join in than primary male students;
- Most students reported that they would tell friends and family about these activities (66%). Primary students were more positive about this question. Similarly, female students were more positive than male students;
- Most students reported that they had never used the equipment in the activities before (52%).
- About half of the students reported that they thought the activities would be useful for their science classes (52%). Primary students were more positive about this aspect than secondary students. Similarly, students from more deprived schools were more positive about the usefulness of these activities than those who attended less deprived schools;
- The activities promoted interest in choosing a STEM subject in the future (53% of students). This finding is more noticeable for primary than secondary students and for male than female students;
- Most students reported being more likely to consider a career in STEM due to these activities (58%). This likelihood is greater for primary students, male students and those who attended more deprived schools;
- Less than half of students reported that they knew about this type of research being carried out in the UK (43%). However, secondary students were more aware than primary students. Similarly, male students were more aware than female students and students from less deprived schools than those who attended more deprived schools.

3.3.4 Findings from the open-ended questions

The three student questionnaires included the same five independent open-ended questions. The number of student responses for each question varied between 1,850 and 2,391. Additionally, there are two follow-up questions for two of the multiple-choice questions. The number of student responses from these questions were 1,650 and 2,195. The full results can be found in Appendix 1**: Students' Questionnaires**. Findings from the quantitative analysis of these questions include:

- Overall; students were engaged and enthusiastic about the activities. They valued the interactivity and learned new knowledge and they had the possibility to interact with equipment and experiment;
- 'Everyone could get involved and have fun' - they felt that it was more interactive and fun than their normal school science classes;
- 'Getting shocked' - students valued the surprises and discoveries they made during the activity, the use of the equipment made the activities more interesting than in the school classroom;

- 'Experimenting' - overall students enjoyed being able to interact directly with the equipment, such as the plasma ball which 'looked really cool when I touched it'. Many of the memorable experiences that were referred to by students related to their hands-on experiences;
- Equipment - one of the noticeable differences between their science classrooms and the activities was the equipment;
- Significance of the research - about half of the students did not know that the type of research presented in these activities was done in the UK. Most of the students felt inspired and recognised the value of this research;
- Social impact; most students seemed willing to share their experience with their friends and family. They indicated that their experience might inspire them and maybe encourage them to go to the science centre again.

3.4 Findings from the teacher evaluation forms

3.4.1 Findings from School and Event Teacher Questionnaire

A total of 129 teachers participated in the evaluation for these activities from nine centres. Details of the results can be found in Appendix 2: **School and Event Teacher Questionnaire**

Findings from the quantitative analysis of this questionnaire include:

- Overall, 93% of the teachers gave a positive evaluation of the activities;
- The content, equipment and the expertise of the staff were evaluated very positively; more than 90% of the responses in all these aspects were positive. The content and the equipment were better evaluated by teachers who were visited by a centre in comparison to the responses of those who visited a centre. Teachers from more deprived schools were more positive about the content and the expertise of staff than those who work in less deprived schools;
- Most teachers reported that they would talk with their students about EYU content in the future (77%), Most teachers reported that they will use the EYU content in the classroom, slightly fewer will research these topics and a similar number reported that they would share what they have learned with colleagues. 66% of the teachers reported that they were interested in attending CPD on this topic;
- Most teachers would recommend these activities to other teachers (98%);
- Most of the teachers did not know about STFC before the activity (88%);
- The funding for visiting the centre is crucial for teachers, if the cost is covered then over 90% of teachers reported that they would take students to a science centre or arrange an outreach visit. With no cost cover this percentage drops to 30% and 43%, respectively.

3.4.2 Findings from the open-ended questions within School Career event teacher questionnaires

The overall number of teacher responses for each question varied between 50 and 129. Full details of the results can be found in Appendix 2: **Qualitative analysis of the School Event Teacher questionnaire**. Key findings from the quantitative analysis of these questions include:

- Overall; teachers were enthusiastic about the activities. Engagement, interactivity and a new way to understand science were identified as key features;
- The equipment used in the activities were also valuable for teachers who explained that students benefit from the interactions with them. A lack of equipment was also recognised as the main barrier for not being able to deliver these activities in schools;
- Teachers recognised that a long-term impact of these activities on their pupils may occur because the science was presented in a 'new way', was more 'fun' and 'stimulating' which might foster students to choose scientific subjects or even, careers;
- Teachers mentioned the topics that they have seen in the activities which matched content in the science curriculum. Specifically, they mentioned space, aspects of electromagnetism and waves.
- Teachers said that they would recommend these activities to other teachers. They valued the methodology used (hands-on), the equipment, and the enthusiasm and knowledge of the centre staff.

3.4.3 Findings from the Teacher CPD Questionnaire

A total of 84 teachers participated in the evaluation of CPD activities offered by three centres. Full details of the results can be found in Appendix 2:

Teacher CPD Questionnaire. Findings from the quantitative analysis of this questionnaire include:

- Overall, all the teachers gave a positive evaluation of the activity and most of them (99%) reported that the activity fully met their expectations. Most teachers had not taken their students to a science centre (70%) and after the course, 90% declared that it was likely that they would take them in the future;
- 93% of the teachers gave a positive evaluation of the activities;
- Teachers felt welcomed (99%) within the activity and all of them felt that they could join in. Teachers felt inspired (96%) and engaged (96%) and regarded the experience as professionally useful (96%). Teachers who worked in more deprived school rated these aspects significantly more positively than those who worked in less deprived schools;
- Teachers' confidence in speaking about the topics covered improved for 75% of the respondents. The rating was greater for teachers who worked in more deprived schools (83%);
- When considering the event, despite the fact that 96% of teachers reported that they will use what they learned in the classroom, responses suggest that for teachers who work in more deprived schools, this course was more significant than for teachers who work in less deprived schools. For example, almost all teachers who worked in more deprived schools were positive about researching these topics and sharing the knowledge with their colleagues, while almost no teachers who worked in less deprived school were positive about the topics;
- Most teachers would take more CPD on these topics (74%).

3.4.5 Findings from the open-ended questions within the Teacher CPD questionnaires

The overall number of teacher responses for each question varied between 9 and 84. Full details of the results can be found in Appendix 2: Qualitative analysis of the Teacher CPD questionnaire. Key findings from the quantitative analysis of these questions include:

- Overall, teacher responses were enthusiastic about the activities. Engagement, interactivity and new ideas to use in their classrooms were highlighted;

- Teachers' expectations of the CPD were fulfilled. These included ideas and activities that they can replicate in their classes, creative approaches for teaching science, content knowledge and the possibility to practise and discuss new knowledge.

3.5 Findings from the telephone interviews

A member of staff from each participating centre (n=14) was interviewed via the telephone or via Skype. Participants were given a list of discussion topics in advance. While some of the centres had been involved in previous phases of EYU, one centre had not and in a few cases interviewees had not attended the training academies.

Overall, the participants were very enthusiastic about their centre's EYU experiences and felt part of a national project that was well supported by ASDC and STFC. Whether or not centres had been involved in designing and writing the activities, there was high praise for what had been provided. This finding is, perhaps, unsurprising since this is Phase 3 of the project.

3.5.1 Impact of the project on centre staff and activities

All centres benefitted substantially from the funding which allowed them to engage with new schools or to strengthen existing relationships. Some centres had identified strategies to ensure that these links could be maintained after the project finished. Many centres seem to have benefitted from a focus on outreach to schools and, in one case, to a prison. Centre staff felt more confident in delivering EYU-type activities beyond their own institution.

3.5.2 Links with other organisations

In a number of cases, the project encouraged the development of greater links between the centres and local institutions such as schools, universities, third-sector organisations and industry.

3.5.3 STFC

All the respondents appeared to understand the role and function of the STFC and could identify ways in which they had integrated this understanding into their shows, talks, etc. The STFC Twitter feed seemed to be a particularly good source of up-to-date materials.

3.5.4 The materials

Particularly popular parts of the kit were the heat-sensitive camera, the Van der Graaf generator and the emission tubes. The kit was uniformly valued as one of the major legacies of the project particularly as there are few consumables to be replenished.

3.5.5 Impact on visitors

All respondents reported enthusiastic responses from students. Some thought that this response was identical between boys and girls however some respondents thought otherwise. Some respondents reported that girls were more engaged and able to interact with presenters and visiting scientists; other respondents thought that 'science is for boys' was a stereotype displayed by students and, more worryingly, by accompanying adults.

3.5.6 The topics

Almost all the respondents thought that today's audiences were keen to know about space. Many referred to the 'Tim Peake effect'. One centre had seen a dip in interest in space this year compared with last but they were still getting good bookings for their primary space-related workshops.

3.5.7 Schools

The centre staff presented a picture of the UK schooling system that was worrying. Inadequate funding for travel, poor classroom resources and teacher shortages were mentioned. Weak teacher knowledge of science topics was also raised as an issue. These perceptions only reinforce the value of science and discovery centres in the science education of young people.

3.5.8 The EYU website

The EYU website was used by the respondents but not a great deal. The Scottish centres meet regularly (quarterly) but contact between centres in England was more *ad hoc* – because of the greater distances involved in meeting up.

3.5.9 The evaluation

The evaluation process was seen by some centres as rather onerous for some of the primary school students.

3.5.10 Post-project meeting

Some respondents expressed a desire for a post-project meeting to share experiences.

Conclusions and recommendations

Phase 3 of Explore Your Universe involved 14 science and discovery centres in delivering a range of activities which involved 39,273 participants (school students, teachers and family groups). The focus of Phase 3 on involving people who might not normally be able to take part led to the centres organising outreach events involving visits to schools or other locations and/or careers events involving local and national employers. Some centres chose to provide bursaries so that schools could take part in events that they would not normally have been able to afford.

All the centres benefitted substantially from the STFC funding which allowed them to engage with new schools or to strengthen existing relationships. Some centres have identified strategies to ensure that these links are maintained after the project finished. Many centres seem to have benefitted from a focus on outreach to schools and, in one case, to a prison. Centre staff felt more confident in delivering EYU-type activities beyond their own institution.

Overall impact of the different modes of delivery

As with previous phases of EYU, participant feedback was very positive whatever type of activity was arranged. For example, of the students whose schools had received bursaries, 89% rated the EYU activities as 'Very Good' or 'Good'. Overall, 93% of the teachers from schools taking part in the activities gave a positive evaluation and almost all teachers (98%) would recommend the activities to other teachers. Perhaps surprisingly, the scientific content and the equipment were slightly better evaluated by teachers who were visited by a centre (outreach) than by teachers who visited a centre.

Differences between the impact on primary and secondary school students across the programme

In general, primary school students were slightly (but statistically significantly) more positive than were secondary school students. It is often the case that primary school students tend to be more positive about STEM activities than secondary school students. Students valued the interactivity of the activities and reported learning something new. Students liked the hands-on nature of the activities and enjoyed using sometimes novel equipment.

Differences between the impact on boys and girls across the programme

Overall, boys and girls were equally positive about the activities. Centre staff reported enthusiastic responses from students however, whereas some thought that this response was identical for boys and girls some respondents thought otherwise. Some respondents reported that girls were more engaged and able to interact with presenters and visiting scientists; other respondents thought that 'science is for boys' was a stereotype displayed by students and, more worryingly, by accompanying adults.

The evaluations from students who attended careers events run by two centres were also very positive. Primary students were significantly more positive about the activity than secondary students which, given what we know about the age at which students begin to make up their mind

about their future careers, is encouraging. Even more encouraging, perhaps, is that female students were more positive than male students, and students who attended more deprived schools were even more positive about the activity than students who attended less deprived schools.

Ten centres organised outreach activities and reached 9,171 participants. Again, primary female students were more positive than male students in terms of their response to the activities overall.

More than half the students were more likely to consider a career in STEM after taking part in the activities (53%). The likelihood was greater for primary than secondary students. Similarly, male students were more encouraged by the activities than were female students.

The impact on children from schools in disadvantaged areas

Encouragingly, given the focus of the project on working with schools in areas of higher deprivation, students from those schools were slightly more positive (91%) about the activities than students from schools in areas of lower deprivation (88%). Similarly, more students from schools in areas of higher deprivation (83%) were inspired than students from schools in areas of lower deprivation (80%).

More than half the students reported that they had never used the equipment in the activities before. Most students (60%) reported that they thought the activities would be useful for their science classes. Primary students were more positive about this aspect than secondary students, and, particularly, primary students from more deprived schools.

Perhaps unsurprisingly, teachers from more deprived schools were more positive about the content and the expertise of staff than those who work in less deprived schools.

Issues specifically related to STFC and ASDC

Half of the students reported that they knew about the type of research described being carried out in the UK. However, secondary students were more aware than primary students, and among secondary students, males claimed to be more informed. Given that most of their teachers did not know about the STFC or its research before the activity (88%) these results may exaggerate students' knowledge of UK research.

The project appears to have been exceptionally well managed and to have been seen as providing a number of positive outcomes by participating centres. The kit was uniformly valued as one of the major legacies of the project particularly as there are few consumables to be replenished.

Perhaps the most worrying aspect of the project was the picture of the UK schooling system that centre staff seemed to paint. Inadequate funding for travel, poor classroom resources and teacher shortages were mentioned. The funding for visiting the centre was crucial for teachers; if the cost is covered then over 90% of teachers reported that they would take students to a science centre or arrange an outreach visit. With no cost cover this percentage dropped to 30% and 43%, respectively.

Weak teacher knowledge of science topics was also raised as an issue. These perceptions only reinforce the value of science and discovery centres in the science education of young people.

Recommendations

1. The demand for programmes such as EYU seems insatiable and they provide essential income for science and discovery centres. If funding can be found for continuing EYU in some form then it would seem to offer good value for money.

Funding for EYU should continue if at all possible.

2. The network of science and discovery centres continues to offer a nationwide system of science engagement and education that adds value to what schools have to offer. This is particularly true in areas of higher deprivation. Centres in Scotland seem to be benefitting from collaborative activities. These activities do not seem so common in England and Wales.

Funding should be sought to enable centres in England and Wales to work together more collaboratively.

Appendix 1: Students' Questionnaires

Results and analysis of the student questionnaires

Results and analysis of three questionnaires are presented in this section: 1) Bursary student questionnaire; 2) Career-Event Student questionnaire; and, 3) Outreach student questionnaire.

The results and quantitative analysis for each multiple-choice question within each questionnaire will be presented as follows: overview of the responses followed by the analysis of the responses. The overview of the responses includes a brief paragraph with a summary of the respondents' group, followed by a figure with the distribution of the responses and a table which includes detail of how the main groups answered the question. The analysis of the responses looks at whether those different groups statistically differ in their responses. A paragraph with the results of these analysis points out the differences and its interpretation, followed by a table including the results of the statistical test.

The statistical analysis that is used within this report is the t-test. The t-test compares two averages (means) and tells you if they are different from each other. The t-test also tells you how significant the differences are (i.e. whether those differences could have happened by chance). For example, this test will answer the question (yes/no) of whether students from schools with lower IMD (group 1) responded significantly differently to a question than students from schools with higher IMD (group 2). Within the first question: 'How would you rate the activities overall?' the t-test run between these two groups gave the answer 'yes' (these groups responded significantly difference) with a 'Sig. (2-tales)'[3] of 0.024 (see the following table). Therefore, the result of this test is telling us that there is less than 2.4% probability that these two groups responded differently by chance.

The results and qualitative analysis of the open-ended questions are presented as follows: overview of the responses followed by the analysis of the responses. The overview of the responses includes a brief paragraph with a summary of the respondents' group, followed by a figure with the distribution of the responses and a table which includes details of how the main groups answered the question. The analysis of the responses looks at whether those different groups statistically differ in their responses. A paragraph with the results of this analysis points out the differences and its interpretation, followed by a table including the results of the statistical test.

Quantitative analysis of student evaluation form

Bursary student questionnaire

A total of 959 students participated in the evaluation of these activities from five centres.

[3] This is the p-value

Table 3. Number of responses from bursary students by centre (n=959)

Bursary Student questionnaire									
	Primary				Secondary				Total
Science Centre	Female	Male	Other	Total	Female	Male	Other	Total	responses
Aberdeen Science Centre	70	68		138	11	11		22	160
Catalyst Science Discovery Centre	113	93		206		7		7	213
Jodrell Bank Discovery Centre	1	1		2	78	89	4	171	173
Techniquest Glyndwr				0	119	111	2	232	232
W5				0	93	88		181	181
Total	**184**	**162**		**346**	**301**	**306**	**6**	**613**	**959**

This questionnaire include eight multiple-choice questions (namely: 4, 5, 6, 9, 10, 11, 12, and 13). Results and analysis of these questions are presented for each question.

Question 4: How would you rate the activities overall?

This question was answered by 948 students (479 females, 464 males, 5 other). From primary students, 343 answers were collected, therefore 605 answers corresponded to secondary students. In terms of the IMD, 274 answers come from students attending schools within the first IMD quintile (more deprived), while 83 answers come from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'How would you rate the activities overall?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 1. Bursary students' overall ratings of the activities (n=948)

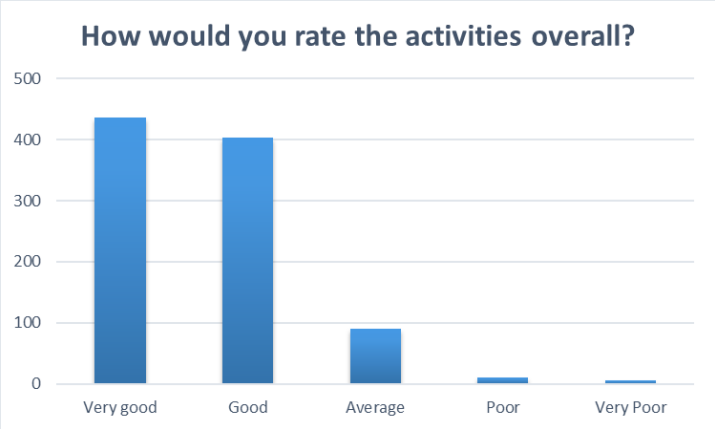

Table 4. Bursary students' overall ratings of the activities (n=948)

How would you rate the activities overall?						
Groups	Very good	Good	Average	Poor	Very Poor	Total
Primary	209	106	21	4	3	343
Secondary	228	297	70	7	3	605
Female	225	198	49	5	2	479
Male	211	203	40	6	4	464
Other	1	2	2	0	0	5
More deprived	127	111	29	4	3	274
Less deprived	56	24	3	0	0	83

Overall, the majority of the students (89%) gave a positive evaluation of the activity while less than 2% gave a negative evaluation. Statistical differences in the responses were found when compared with primary/secondary and higher IMD/lower IMD. Thus, primary students were significantly more positive about the activity than secondary students. Students who attended schools with higher IMD were less positive (87% 'very good' or 'good') about the activity than students who attended schools with lower IMD (96%). No significant differences were found when comparing female and male answers.

When comparing group responses within primary students, differences between gender and IMD were found. In terms of gender differences, primary female students were more positive about the activity than primary male students. The following table shows the results for the statistical test for the different groups.

Table 5. Bursary students' overall ratings of the activities (n=948)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	343	Yes	5.526	702.594	0
		Secondary	605				
	Gender	Female	479	No	-0.354	937.735	0.723
		Male	464				
	IMD	More deprived	274	Yes	-3.645	355	0
		Less deprived	83				
Primary student responses	Gender	Female	182	Yes	-2.391	341	0.017
		Male	161				
	IMD	More deprived	165	No	-1.43	116.788	0.155
		Less deprived	53				
Secondary student responses	Gender	Female	30	Yes	-5.975	77.712	0
		Male	109				
	IMD	More deprived	255	No	0.066	161.567	0.948
		Less deprived	100				

Question 5: How did the activities make you feel?

a) 'I felt welcome'

This question was answered by 910 students (465 females, 447 males, 5 other). From primary students, 315 answers were collected and 602 came from secondary students. In terms of the IMD, 263 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 76 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 2. Bursary students' ratings of how welcome they felt (n=910)

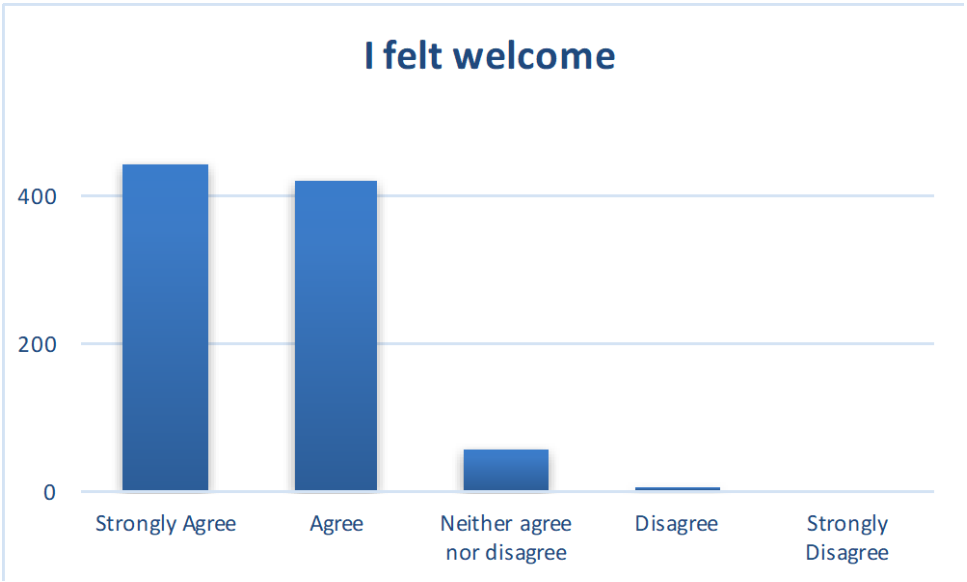

Table 6. Bursary students' ratings of how welcome they felt (n=910)

How did the activities make you feel? I felt welcome						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	179	115	17	4	0	315
Secondary	260	302	38	2	0	602
Female	216	227	20	2	0	465
Male	221	188	34	4	0	447
Other	2	2	1	0	0	5
More deprived	139	104	16	4	0	263
Less deprived	34	41	1	0	0	76

Overall, students reported to have felt welcomed to the activity (93%), statistical differences in the responses were found only when comparing responses from primary and secondary students. In that respect, despite the fact that both groups felt welcomed, primary students felt more welcomed ('Strongly agree': 57%) than secondary students ('Strongly agree': 43%). The following table shows the results for the statistical test for the different groups.

Table 7. Bursary students' ratings of how welcome they felt (n=910)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	315	Yes	2.828	599.321	0.005
		Secondary	602				
	Gender	Female	465	No	-0.297	910	0.766
		Male	447				
	IMD	More deprived	263	No	0.036	337	0.971
		Less deprived	76				
Primary student responses	Gender	Female	168	No	-1.867	313	0.063
		Male	147				
	IMD	More deprived	154	No	0.59	198	0.556
		Less deprived	46				
Secondary student responses	Gender	Female	30	No	-0.767	51.185	0.447
		Male	109				
	IMD	More deprived	274	No	0.365	180.183	0.716
		Less deprived	83				

b) 'I felt inspired'

This question was answered by 918 students (466 females, 447 males, 5 other). From primary students, 312 answers were collected and 606 answers came from secondary students. In terms of the IMD, 263 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 76 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 3. Bursary students' ratings of how inspired they felt (n=918)

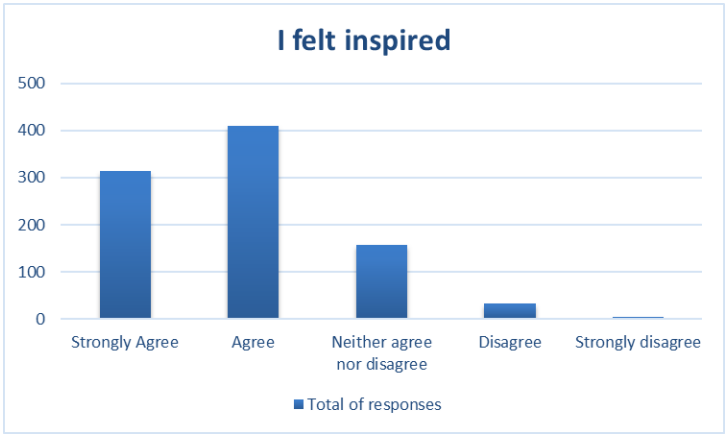

Table 8. Bursary students' ratings of how inspired they felt (n=918)

How did the activities make you feel? I felt inspired						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	164	107	32	8	1	312
Secondary	149	303	125	26	3	606
Female	150	214	84	16	2	466
Male	162	194	72	17	2	447
Other	1	2	1	1	0	5
More deprived	106	103	41	11	2	263
Less deprived	24	42	9	1	0	76

Overall, students felt welcomed to the activity (79%). Statistical differences in the responses were found when compared with responses from primary and secondary students and between female and male responses. In that respect, primary students felt more inspired ('Strongly agree': 53%) than secondary students ('Strongly agree': 25%) after the activity. In terms of gender, females reported that they felt slightly less inspired ('Strongly agree': 32%) than males ('Strongly agree': 36%). The following table shows the results for the statistical test for the different groups.

Table 9. Bursary students' ratings of how inspired they felt (n=918)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	312	Yes	7,512	916	0
		Secondary	606				
	Gender	Female	466	No	0,941	907,437	0,347
		Male	447				
	IMD	Lower IMD	439	No	-0,447	434,239	0,655
		Higher IMD	207				
Primary student responses	Gender	Female	168	No	-0,446	285,27	0,656
		Male	144				
	IMD	Lower IMD	181	No	-1,183	286	0,238
		Higher IMD	107				
Secondary student responses	Gender	Female	298	No	1,874	598,836	0,061
		Male	303				
	IMD	Lower IMD	258	No	1,211	174,93	0,227
		Higher IMD	100				

c) 'I was able to join in and be part of the activities'

This question was answered by 940 students (479 females, 456 males, 5 other). From primary students, 296 answers were collected and 607 from secondary students. In terms of the IMD, 254 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 76 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 4. Bursary students' ratings of how able they felt to join in (n=940)

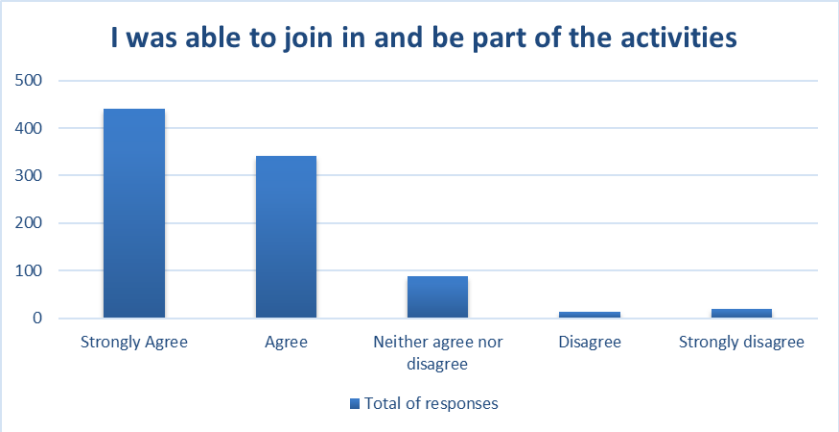

Table 10. Bursary students' ratings of how able they felt to join in (n=940)

How did the activities make you feel? I was able to join in and be part of the activities						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	146	84	42	9	15	296
Secondary	294	258	47	4	4	607
Female	213	176	48	7	6	450
Male	226	164	39	6	12	447
Other	1	2	2	0	1	6
More deprived	100	104	27	8	15	254
Less deprived	52	17	7	0	0	76

Overall, students reported that they were able to join in and be part of the activity (87%), statistical differences in the responses were found when compared with responses from primary and secondary students and between students from schools with higher and lower IMD. In that respect, secondary students felt more able to join in the activity (positive responses: 91%) in comparison with primary students (positive responses: 77%). In terms of IMD, students who came from schools with higher IMD felt less able to join in the activity ('Strongly agree': 39%) than students from schools with lower IMD (68%). The following table shows the results for the statistical test for the different groups.

Table 11. Bursary students' ratings of how able they felt to join in (n=940)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	296	Yes	-3.876	901	0
		Secondary	607				
	Gender	Female	450	No	0.269	888.401	0.788
		Male	447				
	IMD	More deprived	254	Yes	-4.181	328	0
		Less deprived	76				
Primary student responses	Gender	Female	151	No	0.309	291.746	0.758
		Male	145				
	IMD	More deprived	144	Yes	-3.244	188	0.001
		Less deprived	46				
Secondary student responses	Gender	Female	30	Yes	-3.539	138	0.001
		Male	110				
	IMD	More deprived	259	No	-0.182	158.587	0.856
		Less deprived	99				

Question 6: Will you tell your friends and family about these activities?

This question was answered by 945 students (477 females, 462 males, 6 other). From primary students, 340 answers were collected, therefore 605 answers corresponded to secondary students. In terms of the IMD, 274 answers came from students attending schools within the first IMD quintile (more deprived), while 84 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Will you tell your friends and family about these activities?' This figure is followed by a table with the percentage for

each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 5. Bursary students' ratings of how likely they would be to tell friends and family (n=945)

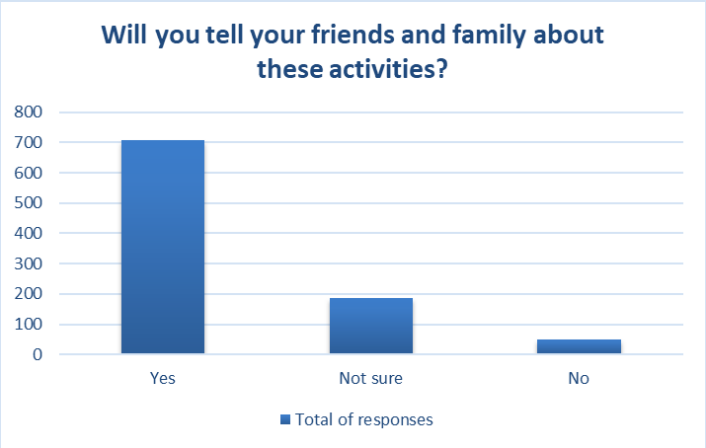

Table 12. Bursary students' ratings of how likely they would be to tell friends and family (n=945)

Will you tell your friends and family about these activities?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Primary	275	54	11	340
Secondary	433	132	40	605
Female	368	85	24	477
Male	337	100	25	462
Other	3	1	2	6
More deprived	206	52	16	274
Less deprived	68	14	2	84

Overall, students reported that they would tell their friends and family about these activities (75%). It is noteworthy that female students are statistically more positive (77%) than male students (73%). This difference was stronger in primary students, where 83% of primary female students reported that they would tell friends and family about these activities in comparison with the 75% of primary male students that reported the same. The following table shows the results for the statistical test for the different groups.

Table 13. Bursary students' ratings of how likely they would be to tell friends and family (n=945)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	340	Yes	2.819	943	0.005
		Secondary	605				
	Gender	Female	477	No	-1.537	937	0.125
		Male	462				
	IMD	More deprived	274	No	143.591	0.398	0.101
		Less deprived	84				
Primary student responses	Gender	Female	180	Yes	-2.367	338	0.018
		Male	160				
	IMD	More deprived	164	No	1.199	216	0.232
		Less deprived	54				
Secondary student responses	Gender	Female	30	Yes	-2.626	138	0.01
		Male	110				
	IMD	More deprived	258	No	0.2	179.479	0.842
		Less deprived	100				

Question 9: Have you used this type of equipment before at your school?

This question was answered by 934 students (475 females, 453 males, 6 other). From primary students, 333 answers were collected, therefore 601 answers corresponded to secondary students. In terms of the IMD, 268 answers came from students attending schools within the first IMD quintile (more deprived), while 84 answers come from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Have you used this type of equipment before at your school?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 6. Bursary students' ratings of whether they had used the equipment in school (n=934)

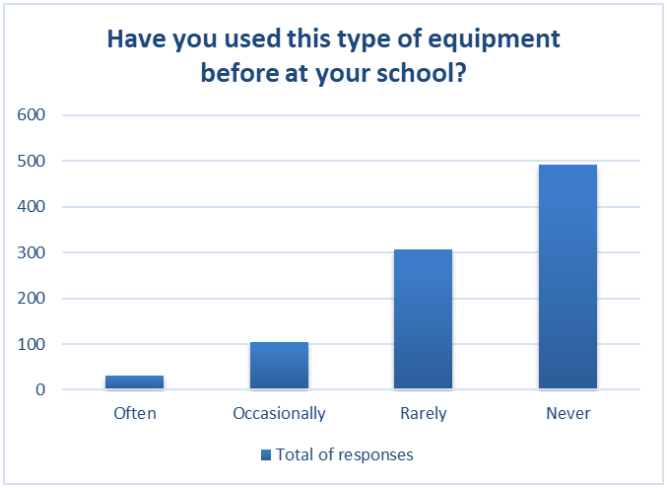

Table 14. Bursary students' ratings of whether they had used the equipment in school (n=934)

Have you used this type of equipment before at your school?					
Groups	**Often**	**Occasionally**	**Rarely**	**Never**	**Total**
Primary	7	13	77	236	333
Secondary	25	91	229	256	601
Female	16	55	146	258	475
Male	16	49	158	230	453
Other	0	0	2	4	6
More deprived	16	20	79	153	268
Less deprived	1	5	29	49	84

Overall, more than 52% of students reported that they had not used the type of equipment before, while around 33% of them reported that they had rarely used this equipment before. As might be expected, significant differences were found between primary and secondary students, where 71% of primary students were less likely to have used this equipment compared with 43% of secondary students. No significant differences were found between the responses according to the other groups. The following table shows the results for the statistical test for the different groups.

Table 15. Bursary students' ratings of whether they had used the equipment in school (n=934)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	333	Yes	-8.16	932	0
		Secondary	601				
	Gender	Female	475	No	0.584	924.799	0.56
		Male	453				
	IMD	More deprived	268	No	1.199	350	0.231
		Less deprived	84				
Primary student responses	Gender	Female	180	No	0.66	304.436	0.51
		Male	153				
	IMD	More deprived	163	No	0.43	93.832	0.668
		Less deprived	54				
Secondary student responses	Gender	Female	30	No	1.125	133	0.262
		Male	105				
	IMD	More deprived	254	No	0.662	195.986	0.509
		Less deprived	100				

Question 11: Do you think your experience today will help you with school science classes?

This question was answered by 927 students (474 females, 447 males, 6 other). From primary students, 331 answers were collected, therefore 596 answers corresponded to secondary students. In terms of the IMD, 263 answers came from students attending schools within the first IMD quintile (more deprived), while 83 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Do you think your experience today will help you with school science classes?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 7. Bursary students' ratings of whether the activities would help with science classes (n=927)

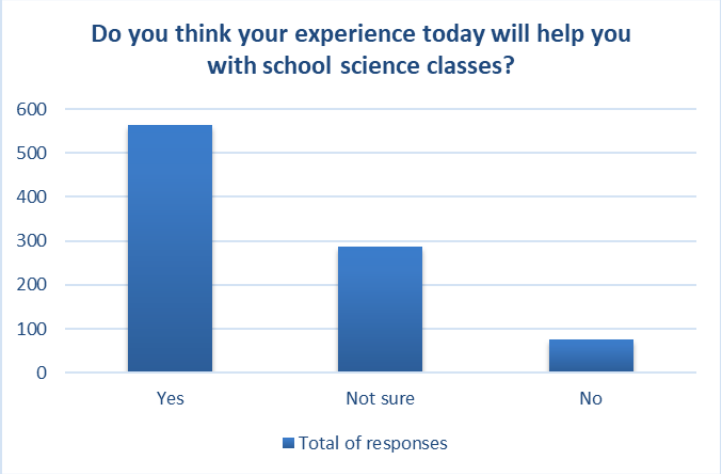

Table 16. Bursary students' ratings of whether the activities would help with science classes (n=927)

Do you think your experience today will help you with school science classes?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Primary	219	94	18	331
Secondary	345	194	57	596
Female	293	146	35	474
Male	268	141	38	447
Other	3	1	2	6
More deprived	177	72	14	263
Less deprived	51	29	3	83

More than 60% of students reported that they thought this experience would help them in school science classes, around 31% reported that they were not sure about it, whereas only 8% reported that they did not think that these activities would help them within science school classes. Differences were found between primary and secondary students; primary students were more positive (66%) regarding the usefulness of this activity in relation to their science school classes while secondary students are less sure of that (positive answer: 58%). Similarly, students from schools with higher IMD were slightly more positive in this respect (67%) than students from schools with lower IMD (61%). The following table shows the results for the statistical test (T-test) for the different groups.

Table 17. Bursary students' ratings of whether the activities would help with science classes (n=927)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	331	Yes	2.004	694.425	0.045
		Secondary	596				
	Gender	Female	474	No	-0.432	915.553	0.666
		Male	447				
	IMD	More deprived	263	No	1.179	344	0.239
		Less deprived	83				
Primary student responses	Gender	Female	178	No	-0.463	318.261	0.644
		Male	153				
	IMD	More deprived	159	Yes	2.667	210	0.008
		Less deprived	53				
Secondary student responses	Gender	Female	30	No	-1.51	132	0.133
		Male	104				
	IMD	More deprived	251	No	1.068	176.69	0.287
		Less deprived	99				

Question 12: Did the activities today make you feel that…

This question was answered by 904 students (459 females, 440 males, 5 other). From primary students, 317 answers were collected, therefore 587 answers corresponded to secondary students. In terms of the IMD, 254 answers came from students attending schools within the first IMD quintile (more deprived), while 83 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did the activities today make you feel that…'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 8. Bursary students' ratings of how the activities made them feel (n=904)

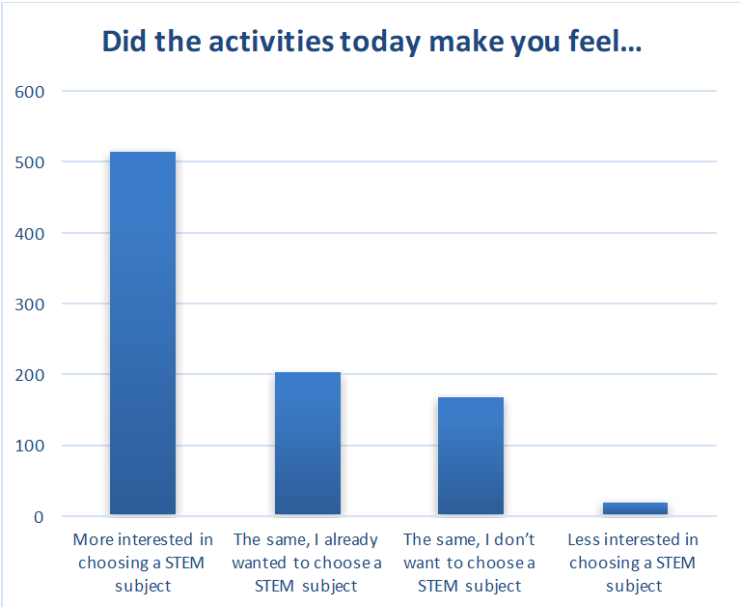

Table 18. Bursary students' ratings of how the activities made them feel (n=904)

Did the activities today make you feel...					
Groups	More interested in choosing a STEM subject	The same, I already wanted to choose a STEM subject	The same, I don't want to choose a STEM subject	Less interested in choosing a STEM subject	Total
Primary	226	51	33	7	317
Secondary	288	152	135	12	587
Female	252	92	105	10	459
Male	259	110	62	9	440
Other	3	1	1	0	5
More deprived	158	55	32	9	254
Less deprived	52	17	13	1	83

Overall, students reported being more interested in choosing a STEM subject than before the activity (59%). Statistical differences within the responses were found when comparing the three groups. Primary students were significantly more interested (71%) in choosing a STEM subject due to the activity than secondary students (49%). Similarly, male students were more interested (59%) than female students after the activity (55%). This result was also found within the secondary group, where male students were significantly more interested in choosing a STEM subject (54%) after the activity than secondary female students (44%). No significant differences were found when comparing students' responses from schools with lower and higher IMD. The following table shows the results for the statistical test for the different groups.

Table 19. Bursary students' ratings of how the activities made them feel (n=904)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	317	Yes	5.928	902	0
		Secondary	587				
	Gender	Female	459	Yes	2.298	897	0.022
		Male	440				
	IMD	More deprived	254	Yes	146.141	0.841	0.021
		Less deprived	83				
Primary student responses	Gender	Female	169	No	-0.814	302.794	0.417
		Male	148				
	IMD	More deprived	153	No	1.154	84.19	0.252
		Less deprived	53				
Secondary student responses	Gender	Female	30	Yes	-2.135	64.316	0.037
		Male	101				
	IMD	More deprived	245	No	-0.033	188.849	0.974
		Less deprived	100				

Question 13: Did the activities today make you feel that…

This question was answered by 890 students (450 females, 435 males, 5 other). From primary students, 307 answers were collected, therefore 583 answers corresponded to secondary students. In terms of the IMD, 253 answers came from students attending schools within the first IMD quintile (more deprived), while 81 answers came from students attending schools within the fifth IMD quintile (less deprived).

Figure 9 shows the overall distribution of the responses for the question 'Did the activities today make you feel that…'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 9. Bursary students' ratings of how the activities made them feel (n=890)

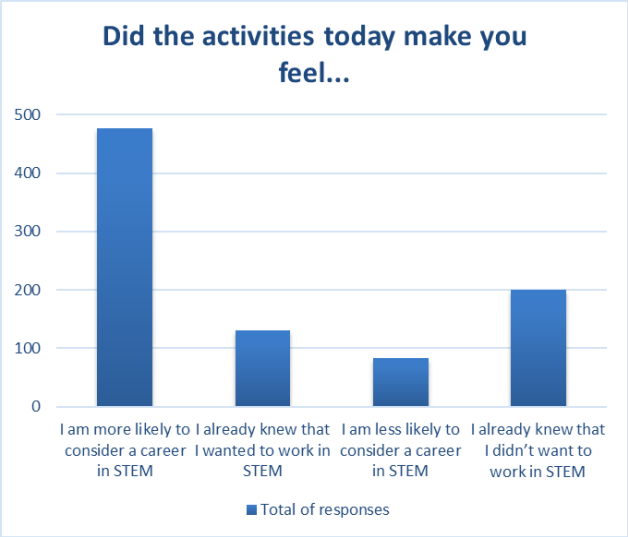

Table 20. Bursary students' ratings of how the activities made them feel (n=890)

Did the activities today make you feel...					
Groups	I am more likely to consider a career in STEM	I already knew that I wanted to work in STEM	I am less likely to consider a career in STEM	I already knew that I didn't want to work in STEM	Total
Primary	191	23	28	65	307
Secondary	285	107	55	136	583
Female	252	92	105	10	459
Male	259	110	62	9	440
Other	3	1	1	0	5
More deprived	141	38	27	47	253
Less deprived	43	7	5	26	81

Overall, almost 70% of students reported that they were more likely to consider a career in STEM or already knew that they wanted to work in STEM. There were significant differences in the responses of the three groups. Thus, primary students were significantly more positive (62%) about considering a career in STEM than secondary students (49%) after the activity. Similarly, male students were significantly more positive (56%) about considering a career in STEM than female students (51%) after the activity. This result was also found within the secondary students group, where male students were more interested in a STEM career (55%) after the activity than female students (42%). No significant differences were found when comparing students' responses from schools with lower and higher IMD. The following table shows the results for the statistical test for the different groups.

Table 21. Bursary students' ratings of how the activities made them feel (n=890)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	307	Yes	3.23	888	0.001
		Secondary	583				
	Gender	Female	450	Yes	2.463	883	0.014
		Male	435				
	IMD	More deprived	253	No	1.462	332	0.145
		Less deprived	81				
Primary student responses	Gender	Female	162	No	-1.194	298.574	0.234
		Male	145				
	IMD	More deprived	151	Yes	2.355	201	0.019
		Less deprived	52				
Secondary student responses	Gender	Female	29	No	-0.677	43.763	0.502
		Male	102				
	IMD	More deprived	245	No	0.824	172.26	0.411
		Less deprived	97				

Question 14: Did you know that the UK did this sort of research before today?

This question was answered by 905 students (461 females, 438 males, 6 other). From primary students, 314 answers were collected, therefore 591 answers corresponded to secondary students. In terms of the IMD, 256 answers came from students attending schools within the first IMD quintile (more deprived), while 81 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did you know that the UK did this sort of research before today?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 10. Bursary students' ratings of whether they were aware of the research in the UK activities (n=905)

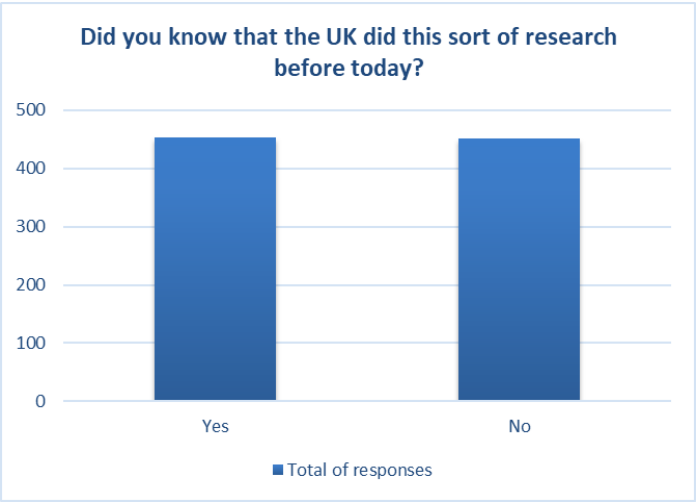

Table 21. Bursary students' ratings of whether they were aware of the research in the UK activities (n=905)

Did you know that the UK did this sort of research before today?			
Groups	**Yes**	**No**	**Total**
Primary	122	192	314
Secondary	332	259	591
Female	208	253	461
Male	243	195	438
Other	3	3	6
More deprived	120	136	256
Less deprived	31	50	81

Overall, 50% of the students knew that the UK did this type of research before the activity. However, great differences are found when comparing the responses between groups. Thus, secondary students were significantly more aware of this information (56%) than primary students (39%). Similarly, male students were more aware (55%) than female students (45%). When comparing groups within secondary students, it can be noticed that male students were significantly more aware of this type of research in the UK (60%) than their female classmates (48%), and when compared by IMD, students from schools with lower IMD were significantly less aware of this sort of research (38%) than their counter-parts who came from schools with higher IMD (47%). The following table shows the results for the statistical test for the different groups.

Table 22. Bursary students' ratings of whether they were aware of the research in the UK activities (n=905)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	314	Yes	-5.024	903	0
		Secondary	591				
	Gender	Female	461	Yes	3.119	894.759	0.002
		Male	438				
	IMD	More deprived	256	No	1.357	335	0.176
		Less deprived	81				
Primary student responses	Gender	Female	169	No	0.616	303.231	0.538
		Male	145				
	IMD	More deprived	152	No	-0.448	86.613	0.656
		Less deprived	52				
Secondary student responses	Gender	Female	29	Yes	2.657	45.223	0.011
		Male	104				
	IMD	More deprived	249	Yes	2.188	346	0.029
		Less deprived	99				

Career–Event Students Questionnaire[4]

A total of 353 students participated in the evaluation of these activities from two centres. The following table shows the distribution of the responses according to gender and the stage of education.

[4] For this questionnaire, the highest and lowest 40% of schools are used when discussing the IMD.

Table 23. Number of responses from career-event students by centre (n=353)

Career Event Student questionnaire									
	Primary				Secondary				Total
Science Centre	Female	Male	N/I	Total	Female	Male	N/I	Total	responses
Dynamic Earth	21	16		37	45	40	2	87	124
Glasgow Science Centre	50	37	3	90	55	83	1	139	229
Total	71	53	3	127	100	123	3	226	353

This questionnaire includes eight closed questions (namely: 4, 5, 6, 9, 10, 11, 12, and 13). Results and analysis of these questions are presented question by question.

Question 4: How would you rate the activities overall?

This question was answered by 352 students (170 females, 176 males, 6 other). From primary students, 127 answers were collected, therefore 225 answers corresponded to secondary students. In terms of the IMD, 291 answers came from students attending schools within the first and second IMD quintile (more deprived), while 61 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'How would you rate the activities overall?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 11. Career-event students' ratings of the activities (n=352)

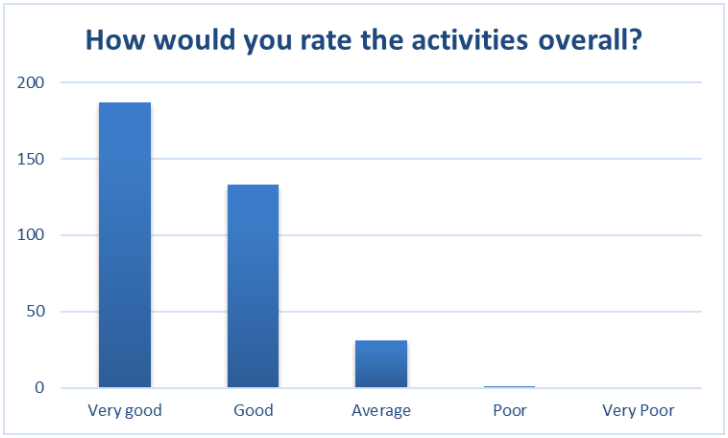

Table 24. Career-event students' ratings of the activities (n=352)

How would you rate the activities overall?						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Primary	85	37	5	0	0	127
Secondary	102	96	26	1	0	225
Female	100	59	11	0	0	170
Male	85	71	19	1	0	176
Other	2	3	1	0	0	6
Lower IMD	164	101	26	0	0	291
Higher IMD	23	32	5	1	0	61

The majority of the students (91%) gave a positive evaluation of the activity while less than 1% gave a negative evaluation. Statistical differences in the responses were found when comparing the three main groups, namely, primary/secondary students, gender and IMD. Thus, primary students were significantly more positive ('Very good' or 'Good': 96%) in the evaluation of the activity than secondary students ('Very good' or 'Good': 88%). Likewise, female students were more positive (very good = 59%) than male students ('Very good': 48%). Similarly, students who came from schools with lower IMD were more positive ('Very good': 56%) than those who came from schools with higher IMD ('Very good': 38%). When comparing the responses between primary students, no significant differences were found. Contrary to this finding, for secondary students, significant differences were found for gender and IMD. Specifically, female secondary students were more positive about the activity ('Very good': 55%) than males ('Very good': 40%). Similarly, secondary students from schools with lower IMD were more positive about the activity ('Very good': 49%) than those who came from schools with higher IMD ('Very good': 30%).

Table 25. Career-event students' ratings of the activities (n=352)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	127	Yes	4.181	350	0
		Secondary	225				
	Gender	Female	170	Yes	-2.263	341.559	0.024
		Male	176				
	IMD	Lower IMD	291	Yes	-2.265	460.407	0.024
		Higher IMD	61				
Primary student responses	Gender	Female	71	No	0.878	119.836	0.382
		Male	53				
	IMD	Lower IMD	110	Insufficient sample size			
		Higher IMD	17				
Secondary student responses	Gender	Female	99	Yes	-2.724	218.64	0.007
		Male	123				
	IMD	Lower IMD	181	Yes	2.038	64.393	0.046
		Higher IMD	44				

Question 5: How did the activities make you feel?

a) 'I felt welcome'

This question was answered by 352 students (170 females, 176 males, 6 other). From primary students, 127 answers were collected and 225 came from secondary students. In terms of the IMD,

291 answers came from students attending schools within the first and second IMD quintile (lower IMD or more deprived), while 61 answers came from students attending schools within the fourth and fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 12. Career-event students' ratings of how welcome the activities made them feel (n=352)

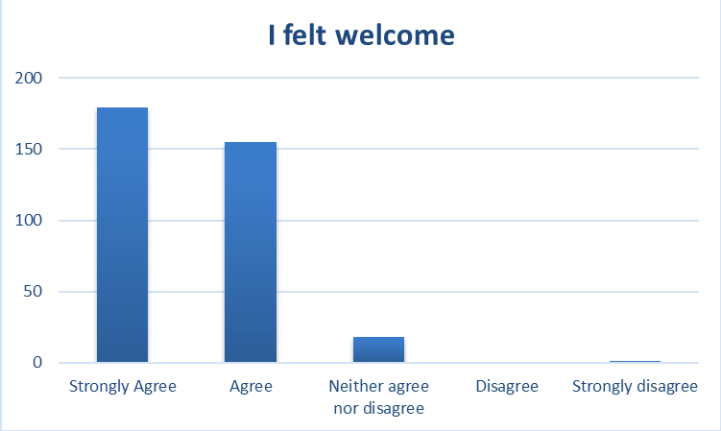

Table 26. Career-event students' ratings of how welcome the activities made them feel (n=352)

	How did the activities make you feel? I felt welcome					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Primary	70	52	5	0	0	127
Secondary	109	103	13	0	1	226
Female	91	74	6	0	0	171
Male	86	77	12	0	1	176
Other	2	4	0	0	0	6
Lower IMD	154	122	15	0	1	292
Higher IMD	25	33	3	0	0	61

Overall, students reported to have felt welcomed to the activity (95%) while less than 1% of the students evaluate negatively this aspect ('Disagree' or 'Strongly disagree'). Statistical differences in the responses were found only when comparing the gender group within secondary students. In that respect, despite the fact that both groups felt welcomed, female secondary students felt more welcomed ('Strongly agree': 53%) than male secondary students ('Strongly agree': 49%). The following table shows the results for the statistical test for the different groups.

Table 27. Career-event students' ratings of how welcome the activities made them feel (n=352)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	127	No	1.507	285.614	0.133
		Secondary	226				
	Gender	Female	171	No	-1.408	338.846	0.16
		Male	176				
	IMD	Lower IMD	292	No	-0.912	446.304	0.363
		Higher IMD	61				
Primary student responses	Gender	Female	71	No	1.938	113.696	0.055
		Male	53				
	IMD	Lower IMD	110	Insufficient sample size			
		Higher IMD	17				
Secondary student responses	Gender	Female	100	Yes	-2.884	220.989	0.004
		Male	123				
	IMD	Lower IMD	182	No	1.417	70.265	0.161
		Higher IMD	44				

b) 'I felt inspired'

This question was answered by 352 students (170 females, 176 males, 6 other). From primary students, 127 answers were collected and 225 answers came from secondary students. In terms of the IMD, 291 answers came from students attending schools within the first and second IMD quintile (lower IMD or more deprived), while 61 answers came from students attending schools within the fourth and fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary), Gender (female/male), IMD (lower IMD/higher IMD.

Figure 13. Career-event students' ratings of how inspired the activities made them feel (n=352)

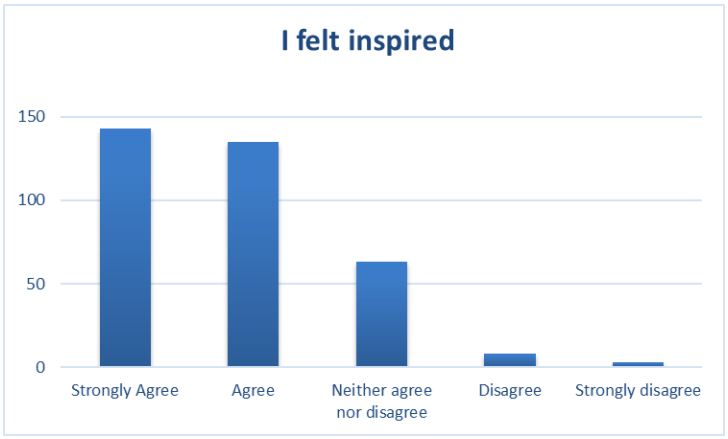

Table 28. Career-event students' ratings of how inspired the activities made them feel (n=352)

How did the activities make you feel? I felt inspired						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	56	48	20	1	2	127
Secondary	87	87	43	7	1	225
Female	74	67	27	1	1	170
Male	68	66	34	6	2	176
Other	1	2	2	1	0	6
Lower IMD	127	111	44	6	3	291
Higher IMD	16	24	19	2	0	61

Most students reported feeling inspired after the activity (79%) while about 3% felt less inspired. Statistical differences in the responses were only found when comparing responses within secondary students. Female secondary students were significantly more positive about this question (strongly agreed: 46%) than male secondary students (strongly agreed: 33%). Additionally, secondary students from schools with a lower IMD reported to feel more inspired after the activity (strongly agreed = 44%) than those who came from schools with a higher IMD (strongly agreed = 31%). The following table shows the results for the statistical test for the different groups.

Table 29. Career-event students' ratings of how inspired the activities made them feel (n=352)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	127	No	1.06	261.859	0.29
		Secondary	225				
	Gender	Female	170	No	-1.721	340.135	0.086
		Male	176				
	IMD	Lower IMD	291	No	-0.447	434.239	0.655
		Higher IMD	61				
Primary student responses	Gender	Female	71	No	0.853	110.513	0.396
		Male	53				
	IMD	Lower IMD	110	Insufficient sample size			
		Higher IMD	17				
Secondary student responses	Gender	Female	99	Yes	-2.753	219.981	0.006
		Male	123				
	IMD	Lower IMD	181	Yes	2.716	67.669	0.008
		Higher IMD	44				

c) 'I was able to join in and be part of the activities'

This question was answered by 350 students (169 females, 175 males, 6 other). From primary students, 126 answers were collected and 224 from secondary students. In terms of the IMD, 289 answers came from students attending schools within the first and second IMD quintile (lower IMD or more deprived), while 61 answers came from students attending schools within the fourth and fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 14. Career-event students' ratings of the extent they felt able to join in (n=350)

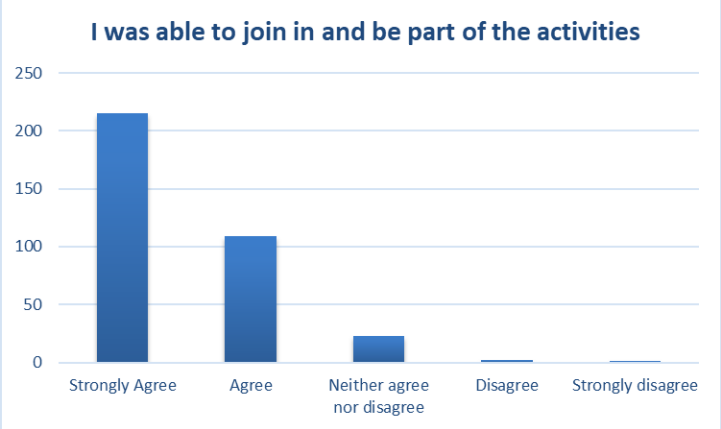

Table 30. Career-event students' ratings of the extent they felt able to join in (n=350)

How did the activities make you feel?	I was able to join in and be part of the activities					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	92	26	7	1	0	126
Secondary	123	83	16	1	1	224
Female	109	53	6	1	0	169
Male	104	54	15	1	1	175
Other	2	2	2	0	0	6
Lower IMD	183	83	20	2	1	289
Higher IMD	32	26	3	0	0	61

Overall, students reported that they were able to join in and be part of the activity (93%), while less than 1% of them disagree or strongly disagree with this claim. Statistical differences in the responses were found when comparing with responses from primary/secondary students and according to IMD. Specifically, primary students felt more able to join in the activity (strongly agreed = 73%) than secondary students (strongly agreed = 55%). Similarly, students who attended more deprived schools were more positive in this aspect (strongly agreed = 63%) than those who attended less deprived schools (strongly agreed = 52%). Another statistical difference in the responses was found when comparing secondary student responses according to gender. In this case, female secondary students felt more able to join in the activity (strongly agreed = 63%) than secondary male students (strongly agreed = 49%). The following table shows the results for the statistical test for the different groups.

Table 31. Career-event students' ratings of the extent they felt able to join in (n=350)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	126	Yes	2.746	348	0.006
		Secondary	224				
	Gender	Female	169	No	-1.645	342	0.101
		Male	175				
	IMD	Lower IMD	289	Yes	-2.358	460.596	0.019
		Higher IMD	61				
Primary student responses	Gender	Female	71	No	1.793	121	0.076
		Male	52				
	IMD	Lower IMD	109	Insufficient sample size			
		Higher IMD	17				
Secondary student responses	Gender	Female	98	Yes	-2.767	219	0.006
		Male	123				
	IMD	Lower IMD	180	No	1.124	78.784	0.265
		Higher IMD	44				

Question 6: Will you tell your friends and family about these activities?

This question was answered by 350 students (171 females, 173 males, 6 other). From primary students, 126 answers were collected, therefore 224 answers corresponded to secondary students. In terms of the IMD, 289 answers came from students attending schools within the first and second IMD quintile (more deprived), while 61 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Will you tell your friends and family about these activities?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 15. Career-event students' ratings of how likely they would be to tell their friends and family (n=350)

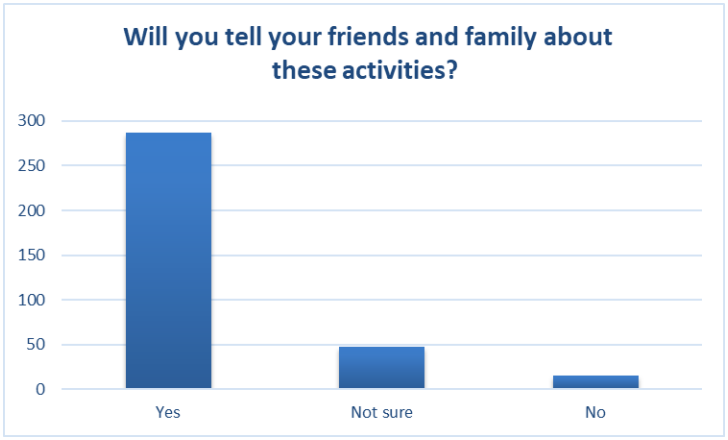

Table 32. Career-event students' ratings of how likely they would be to tell their friends and family (n=350)

Will you tell your friends and family about these activities?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Primary	112	12	2	126
Secondary	175	36	13	224
Female	145	23	3	171
Male	138	24	11	173
Other	4	1	1	6
Lower IMD	240	38	11	289
Higher IMD	47	10	4	61

Most students reported that they would tell their friends and family about these activities (82%). When examining the responses between groups, only one significant difference was found. Primary students were more positive (89%) about sharing these activities with family and friends than secondary students (78%). The following table shows the results for the statistical test for the different groups.

Table 33. Career-event students' ratings of how likely they would be to tell their friends and family (n=350)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	126	Yes	2.228	348	0.027
		Secondary	224				
	Gender	Female	171	No	-0.721	341.892	0.471
		Male	173				
	IMD	Lower IMD	289	No	0.627	408.248	0.531
		Higher IMD	61				
Primary student responses	Gender	Female	71	No	0.3	111.927	0.765
		Male	52				
	IMD	Lower IMD	109	Insufficient sample size			
		Higher IMD	17				
Secondary student responses	Gender	Female	100	No	-0.746	212.126	0.456
		Male	121				
	IMD	Lower IMD	180	No	0.711	62.57	0.479
		Higher IMD	44				

Question 9: Have you used this type of equipment before at your school?

This question was answered by 341 students (166 females, 170 males, 5 other). From primary students, 121 answers were collected, therefore 220 answers corresponded to secondary students. In terms of the IMD, 277 answers came from students attending schools within the first and second IMD quintile (more deprived), while 41 answers come from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Have you used this type of equipment before at your school?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 16. Career-event students' ratings of whether they had used the equipment in school (n=341)

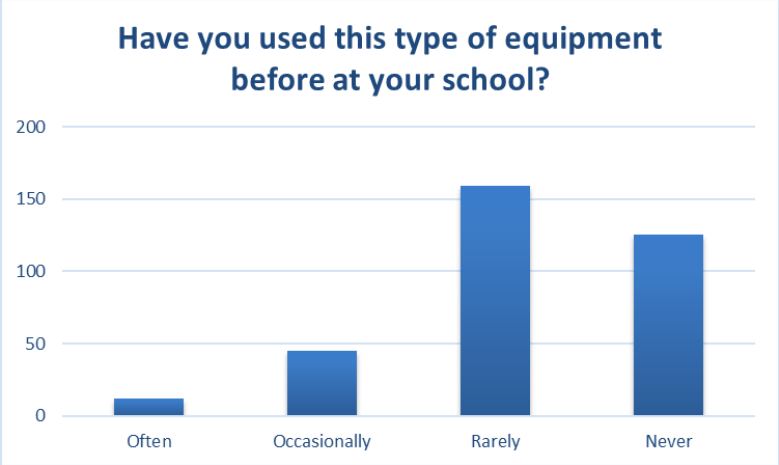

Table 34. Career-event students' ratings of whether they had used the equipment in school (n=341)

Have you used this type of equipment before at your school?					
Groups	**Often**	**y**	**Rarely**	**Never**	**Total**
Primary	4	12	57	48	121
Secondary	8	33	102	77	220
Female	4	17	85	60	166
Male	8	27	72	63	170
Other	0	1	2	2	5
Lower IMD	12	38	88	139	277
Higher IMD	0	7	14	20	41

Overall, more than 82% of students reported that they had never or rarely used this type of equipment before. Significant differences within this response were found only when examining responses from secondary students according to the IMD. Specifically, more secondary students that attended from schools with higher IMD (less deprived schools) had reported to rarely or occasionally use this type of equipment (86%) than secondary students who came from more deprived schools (80%). The following table shows the results for the statistical test for the different groups.

Table 35. Career-event students' ratings of whether they had used the equipment in school (n=341)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	121	No	-1.19	256.607	0.235
		Secondary	220				
	Gender	Female	166	No	1.091	328.408	0.276
		Male	170				
	IMD	Lower IMD	282	No	1.901	459.134	0.058
		Higher IMD	59				
Primary student responses	Gender	Female	68	No	-0.342	103.769	0.733
		Male	51				
	IMD	Lower IMD	105	Insufficient sample size			
		Higher IMD	16				
Secondary student responses	Gender	Female	98	No	1.465	214.998	0.145
		Male	119				
	IMD	Lower IMD	177	Yes	2.639	68.737	0.01
		Higher IMD	43				

Question 11: Do you think your experience today will help you with school science classes?

This question was answered by 336 students (163 females, 167 males, 6 other). From primary students, 120 answers were collected, therefore 216 answers corresponded to secondary students. In terms of the IMD, 280 answers came from students attending schools within the first and second IMD quintile (more deprived), while 56 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Do you think your experience today will help you with school science classes?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 17. Career-event students' ratings of whether they thought the experience would help with science classes (n=336)

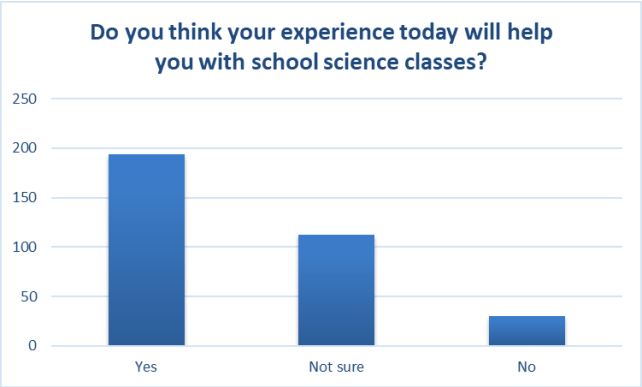

Table 36. Career-event students' ratings of whether they thought the experience would help with science classes (n=336)

Do you think your experience today will help you with school science classes?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Primary	75	41	4	120
Secondary	119	71	26	216
Female	100	55	8	163
Male	92	53	22	167
Other	2	4	0	6
Lower IMD	171	90	19	280
Higher IMD	23	22	11	56

More than 58% of students reported that they thought this experience would help them in school science classes, around 33% reported that they were not sure about it, whereas about 9% reported that they did not think that these activities would help them within science classes. While analysing the differences between groups, differences were found according to the IMD; students from schools with lower IMD were more positive (61%) regarding the usefulness of this activity in relation to their science classes than those who came from less deprived schools (41%). The following table shows the results for the statistical test for the different groups.

Table 37. Career-event students' ratings of whether they thought the experience would help with science classes (n=336)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	120	No	0.575	238.84	0.566
		Secondary	216				
	Gender	Female	163	No	-0.419	326.804	0.675
		Male	167				
	IMD	Lower IMD	280	Yes	2.184	656	0.029
		Higher IMD	56				
Primary student responses	Gender	Female	65	No	0.657	111.18	0.512
		Male	52				
	IMD	Lower IMD	105	Insufficient sample size			
		Higher IMD	15				
Secondary student responses	Gender	Female	98	No	-0.987	203.391	0.325
		Male	115				
	IMD	Lower IMD	175	No	0.809	62.814	0.422
		Higher IMD	41				

Question 12: Did the activities today make you feel that…

This question was answered by 338 students (165 females, 167 males, 6 other). From primary students, 121 answers were collected, therefore 217 answers corresponded to secondary students. In terms of the IMD, 286 answers came from students attending schools within the first and second IMD quintile (more deprived), while 55 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did the activities today make you feel...'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 18. Career-event students' ratings of how they felt about the activities (n=338)

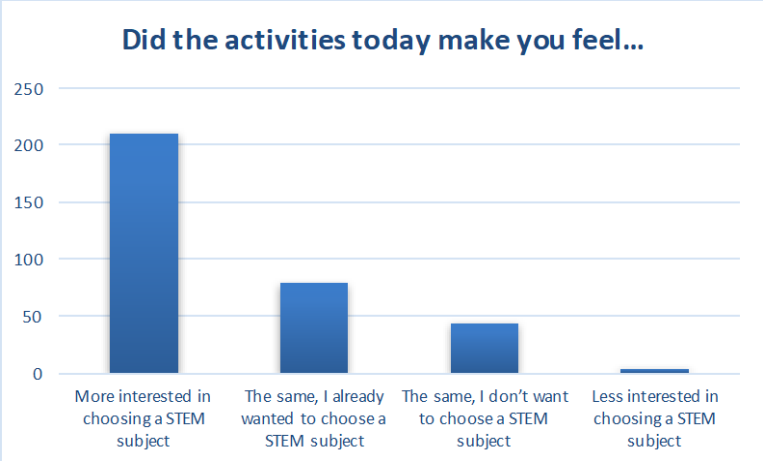

Table 38. Career-event students' ratings of how they felt about the activities (n=338)

Did the activities today make you feel...					
Groups	More interested in choosing a STEM subject	The same, I already wanted to choose a STEM subject	The same, I don't want to choose a STEM subject	Less interested in choosing a STEM subject	Total
Primary	86	19	15	1	121
Secondary	125	60	29	3	217
Female	108	35	22	0	165
Male	99	42	22	4	167
Other	4	2	0	0	6
Lower IMD	182	61	36	4	283
Higher IMD	29	18	8	0	55

Most students reported being more interested in choosing a STEM subject before the activity (62%). While 36% of students reported no changes in their original choice (23% want to choose a STEM subject and 13% do not want to choose those subject), around 1% of students reported to have less interest in choosing a STEM subject. There were no statistical differences in the responses from different groups. The following table shows the results for the statistical test for the different groups.

Table 39. Career-event students' ratings of how they felt about the activities (n=338)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	121	No	1.824	257.263	0.069
		Secondary	217				
	Gender	Female	165	No	-1.286	326.575	0.199
		Male	167				
	IMD	Lower IMD	283	No	-0.991	443.959	0.322
		Higher IMD	55				
Primary student responses	Gender	Female	68	No	0.663	111.706	0.509
		Male	50				
	IMD	Lower IMD	107	Insufficient sample size			
		Higher IMD	14				
Secondary student responses	Gender	Female	97	No	-1.802	212	0.073
		Male	117				
	IMD	Lower IMD	176	No	0.682	60.815	0.498
		Higher IMD	41				

Question 13: Did the activities today make you feel that…

This question was answered by 337 students (166 females, 167 males, 6 other). From primary students, 121 answers were collected, therefore 216 answers corresponded to secondary students. In terms of the IMD, 282 answers came from students attending schools within the first and second IMD quintile (more deprived), while 55 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did the activities today make you feel that...'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 19. Career-event students' ratings of how they felt about the activities (n=337)

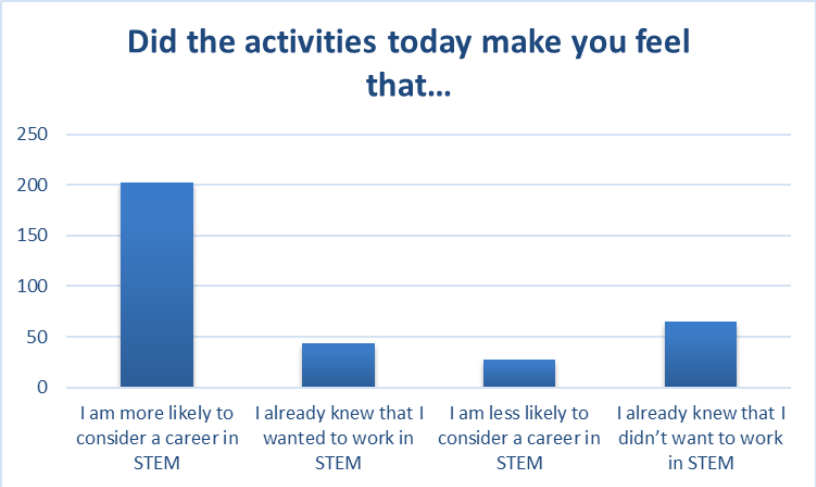

Table 40. Career-event students' ratings of how they felt about the activities (n=337)

	Did the activities today make you feel...				
Groups	I am more likely to consider a career in STEM	I already knew that I wanted to work in STEM	I am less likely to consider a career in STEM	knew that I didn't want to work in STEM	Total
Primary	77	13	10	21	121
Secondary	125	30	17	44	216
Female	98	26	11	31	166
Male	100	17	16	32	165
Other	4	0	0	2	6
Lower IMD	179	29	26	48	282
Higher IMD	23	14	1	17	55

Most students reported being more likely to consider a career in STEM after the activity (60%). While 33% of students reported no changes their opinion (13% want to work in STEM and 20% do not want to work on it), around 8% of students reported to have less interest in choosing a STEM subject. Statistical differences between the responses were found only when comparing secondary student responses according to the IMD. Secondary students from schools with lower IMD reported being more likely to want to work in STEM after the activity (62%) than those who came from schools with higher IMD (39%). The following table shows the results for the statistical test for the different groups.

Table 41. Career-event students' ratings of how they felt about the activities (n=337)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	121	No	1.089	257.273	0.277
		Secondary	216				
	Gender	Female	166	No	0.409	329	0.683
		Male	165				
	IMD	Lower IMD	282	No	0.816	383.225	0.415
		Higher IMD	55				
Primary student responses	Gender	Female	68	No	1.532	116	0.128
		Male	50				
	IMD	Lower IMD	107	Insufficient sample size			
		Higher IMD	14				
Secondary student responses	Gender	Female	98	No	-0.42	208.038	0.675
		Male	115				
	IMD	Lower IMD	175	Yes	3.115	55.942	0.003
		Higher IMD	41				

Question 14: Did you know that the UK did this sort of research before today?

This question was answered by 334 students (163 females, 165 males, 6 other). From primary students, 118 answers were collected, therefore 216 answers corresponded to secondary students. In terms of the IMD, 280 answers came from students attending schools within the first and second IMD quintile (more deprived), while 54 answers came from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did you know that the UK did this sort of research before today?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 20. Career-event students' ratings of whether they knew the research was carried out in the UK (n=334)

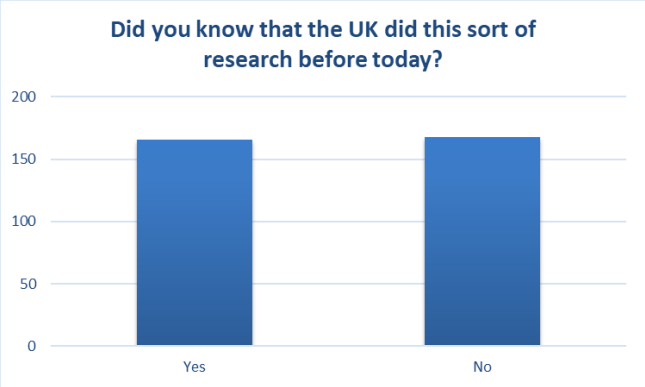

Table 42. Career-event students' ratings of whether they knew the research was carried out in the UK (n=334)

ou know that the UK did this sort of research before today?			
Groups	**Yes**	**No**	**Total**
Primary	45	73	118
Secondary	121	95	216
Female	76	87	163
Male	88	77	165
Other	2	4	6
Lower IMD	134	146	280
Higher IMD	32	22	54

Overall, half of the students knew that the UK did this type of research before the activity. Statistical differences were found when comparing responses according to the level of studies. Primary students are less aware that this type of research is done in UK (38%) than secondary students (56%). No significant differences in the responses were found in other groups. The following table shows the results for the statistical test for the different groups.

Table 43. Career-event students' ratings of whether they knew the research was carried out in the UK (n=334)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	118	Yes	-3.162	332	0.002
		Secondary	216				
	Gender	Female	163	No	1.214	325.951	0.226
		Male	165				
	IMD	Lower IMD	280	No	1.568	417.728	0.118
		Higher IMD	54				
Primary student responses	Gender	Female	66	No	1.877	113	0.063
		Male	49				
	IMD	Lower IMD	104	Insufficient sample size			
		Higher IMD	14				
Secondary student responses	Gender	Female	97	No	-0.223	204.579	0.824
		Male	116				
	IMD	Lower IMD	176	No	-0.912	214	0.363
		Higher IMD	40				

Outreach Student Questionnaire

A total of 2,970 students participated in the evaluation of these activities from 11 centres.

Table 44. Number of responses from outreach students by centre (n=2,970)

Outreach Student questionnaire									
	Primary				Secondary				Total
Science Centre	Female	Male	Other	Total	Female	Male	Other	Total	responses
Aberdeen Science Centre	59	57		116	419	409	52	880	996
Cambridge Science Centre	143	154	2	299				0	299
Catalyst Science Discovery Centre	68	53	1	122				0	122
Dundee Science Centre	6	2	1	9	240	261	20	521	530
Jodrell Bank Discovery Centre				0	21	31		52	52
Science Oxford	12	9		21	4			4	25
Techniquest	136	145		281				0	281
Techniquest Glyndwr				0	33	25		58	58
The Observatory Science Centre	178	154	1	333				0	333
W5				0	48	54	1	103	103
Winchester Science Centre				0	70	97	4	171	171
Total	602	574	5	1181	835	877	77	1789	2970

As the amount of answers surpasses the size of the sample and changes the original distribution of the responses required, a random subset of responses was chosen, maintaining a distribution in terms of centres and gender as close to the original requirement as possible.

Table 45. Number of randomly chosen responses from outreach students by centre (n=1,230)

Outreach Student questionnaire									
	Primary				Secondary				Total
Science Centre	Female	Male	Other	Total	Female	Male	Other	Total	responses
Aberdeen Science Centre	59	57		116	40	30	11	81	197
Cambridge Science Centre	75	75		150				0	150
Catalyst Science Discovery Centre	67	53		120				0	120
Dundee Science Centre				0	100	100	10	210	210
Jodrell Bank Discovery Centre				0	21	19		40	40
Science Oxford	2	2		4	4			4	8
Techniquest				0				0	0
Techniquest Glyndwr				0	33	25		58	58
The Observatory Science Centre	98	112		210				0	210
W5				0	34	31	1	66	66
Winchester Science Centre				0	70	97	4	171	171
Total	301	299	0	600	302	302	26	630	1230

This questionnaire includes eight closed questions (namely: 4, 5, 6, 9, 10, 11, 12, and 13). Results and analysis of these questions are presented by question.

Question 4: How would you rate the activities overall?

This question was answered by 1,209 students (594 females, 589 males, 26 other). From primary students, 590 answers were collected, therefore 619 answers corresponded to secondary students. In terms of the IMD, 371 answers came from students attending schools within the first IMD quintile (more deprived), while 153 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'How would you rate the activities overall?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 21. Outreach students' overall ratings of the activities (n=1,209)

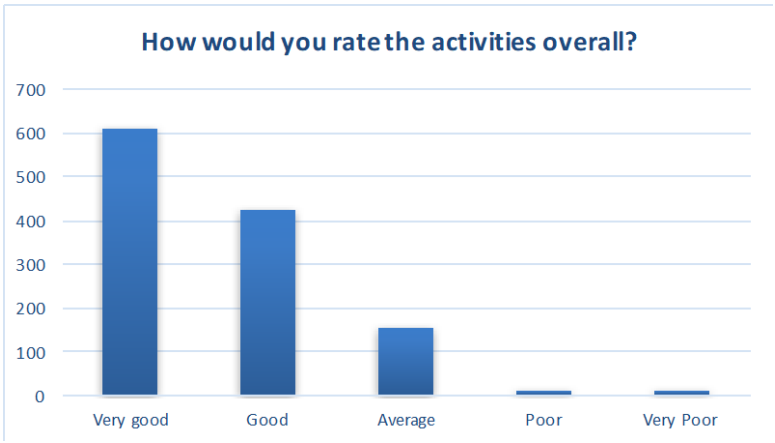

Table 46. Outreach students' overall ratings of the activities (n=1,209)

How would you rate the activities overall?						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Primary	369	165	48	4	4	590
Secondary	243	257	106	7	6	619
Female	319	190	75	7	3	594
Male	284	224	72	4	5	589
Other	9	8	7	0	2	26
More deprived	193	106	64	4	4	371
Less deprived	69	60	22	1	1	153

Overall, the majority of the students (85%) gave a positive evaluation of the activity while less than 2% gave a negative evaluation. Statistical differences in the responses were found when compared with responses from primary and secondary students. Specifically, primary students were more positive about the activity (68%) than secondary students (39%). Also, when comparing primary and secondary, significant differences were found. Thus, within primary students, females were more positive about the activity (very good = 68%) than males ('Very good' = 57%). Students from schools with lower IMD were less positive about the activity ('Very good' = 45%) than students who came from schools with higher IMD (very good = 52%). No significant differences were found between the responses of females and males within secondary students.

Table 47. Outreach students' overall ratings of the activities (n=1,209)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	590	Yes	7.638	1202.27	0
		Secondary	619				
	Gender	Female	594	No	-1.125	1180.997	0.261
		Male	589				
	IMD	More deprived	371	No	0.249	312.364	0.803
		Less deprived	153				
Primary student responses	Gender	Female	298	Yes	-2.026	585.425	0.043
		Male	292				
	IMD	More deprived	237	Yes	2.918	77.71	0.005
		Less deprived	52				
Secondary student responses	Gender	Female	296	No	0.35	590.629	0.726
		Male	297				
	IMD	More deprived	134	Yes	-3.659	226.976	0
		Less deprived	101				

Question 5: How did the activities make you feel?

a) 'I felt welcome'

This question was answered by 1152 students (569 females, 558 males, 25 other). From primary students, 546 answers were collected and 606 came from secondary students. In terms of the IMD, 352 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 156 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 22. Outreach students' ratings of how welcome they felt (n=1,152)

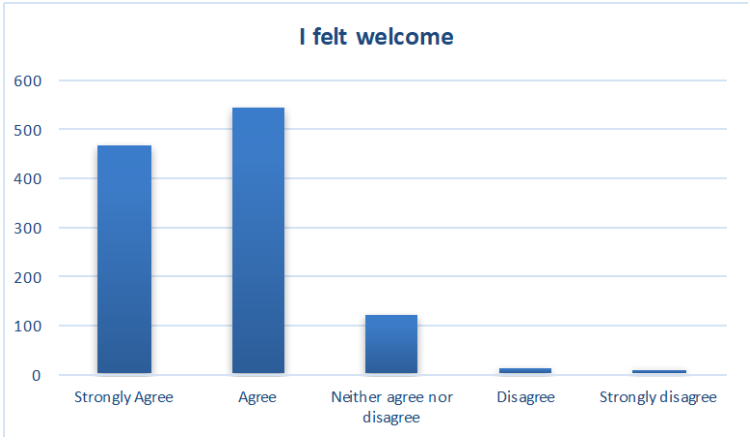

Table 48. Outreach students' ratings of how welcome they felt (n=1,152)

	How did the activities make you feel? I felt welcome					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Primary	267	239	32	4	4	546
Secondary	199	307	89	8	3	606
Female	234	267	59	7	2	569
Male	225	269	57	4	3	558
Other	7	10	5	1	2	25
More deprived	142	163	38	5	4	352
Less deprived	53	76	16	0	1	146

Overall, students reported to have felt welcomed to the activity (88%) while less than 2% of the students evaluate negatively this aspect (poor and very poor). Statistical differences in the responses were found only when comparing responses from primary and secondary students. In that respect, despite the fact that both groups felt welcome, primary students felt more welcomed (strongly agreed: 49%) than secondary students (strongly agreed: 33%). The following table shows the results for the statistical test for the different groups.

Table 49. Outreach students' ratings of how welcome they felt (n=1,152)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	546	Yes	5.96	1147.995	0
		Secondary	606				
	Gender	Female	569	No	-0.042	1124.936	0.966
		Male	558				
	IMD	More deprived	352	No	0.001	304.22	0.999
		Less deprived	146				
Primary student responses	Gender	Female	277	No	-0.113	537.458	0.91
		Male	269				
	IMD	More deprived	221	Yes	2.361	267	0.019
		Less deprived	48				
Secondary student responses	Gender	Female	292	No	0.085	575.045	0.932
		Male	289				
	IMD	More deprived	131	Yes	-2.976	225.201	0.003
		Less deprived	98				

b) 'I felt inspired'

This question was answered by 1,146 students (555 females, 565 males, 26 other). From primary students, 544 answers were collected and 602 answers came from secondary students. In terms of the IMD, 343 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 151 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary), Gender (female/male), IMD (lower IMD/higher IMD.

Figure 23. Outreach students' ratings of how inspired they felt (n=1,146)

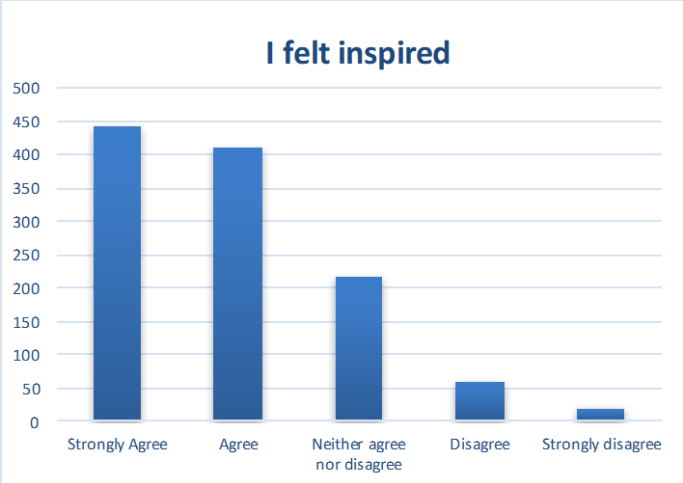

Table 50. Outreach students' ratings of how inspired they felt (n=1,146)

How did the activities make you feel?	I felt inspired					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	296	166	58	15	9	544
Secondary	146	245	158	43	10	602
Female	218	188	110	31	8	555
Male	219	216	100	22	8	565
Other	5	7	6	5	3	26
More deprived	140	110	62	23	8	343
Less deprived	51	57	35	7	1	151

Overall, students reported feeling inspired after the activity (74%) while less than 7% felt less inspired. Statistical differences in the responses were found when compared with responses from primary and secondary students. Primary students were significantly more positive about this question (strongly agreed: 54%) than secondary students (strongly agreed: 24%). Additionally, some differences were found when comparing different groups within secondary students. Thus, secondary female students felt less inspired after the activity (strongly agreed + agree = 62%) than male students (strongly agreed + agree = 69%). Students from schools with lower IMD reported being very slightly more inspired by the activities ('Strongly agree' or 'Agree': 73%) than were students from schools with higher IMD (72%). The following table shows the results for the statistical test for the different groups.

Table 51. Outreach students' ratings of how inspired they felt (n=1,146)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	544	Yes	10.022	1141.697	0
		Secondary	602				
	Gender	Female	555	No	0.896	1111.644	0.37
		Male	565				
	IMD	More deprived	343	No	0.324	324.776	0.746
		Less deprived	151				
Primary student responses	Gender	Female	268	No	-0.942	541.071	0.347
		Male	276				
	IMD	More deprived	213	Yes	2.675	69.569	0.009
		Less deprived	52				
Secondary student responses	Gender	Female	287	Yes	2.104	572.847	0.036
		Male	289				
	IMD	More deprived	130	Yes	-4.271	227	0
		Less deprived	99				

c) 'I was able to join in and be part of the activities'

This question was answered by 1,120 students (546 females, 549 males, 25 other). From primary students, 517 answers were collected and 603 from secondary students. In terms of the IMD, 334 answers came from students attending schools within the first IMD quintile (lower IMD or more deprived), while 134 answers came from students attending schools within the fifth IMD quintile (higher IMD or less deprived).

The next figure shows the overall distribution of the responses for the question 'How did the activities make you feel?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 24. Outreach students' ratings of how able they felt to join in (n=1,120)

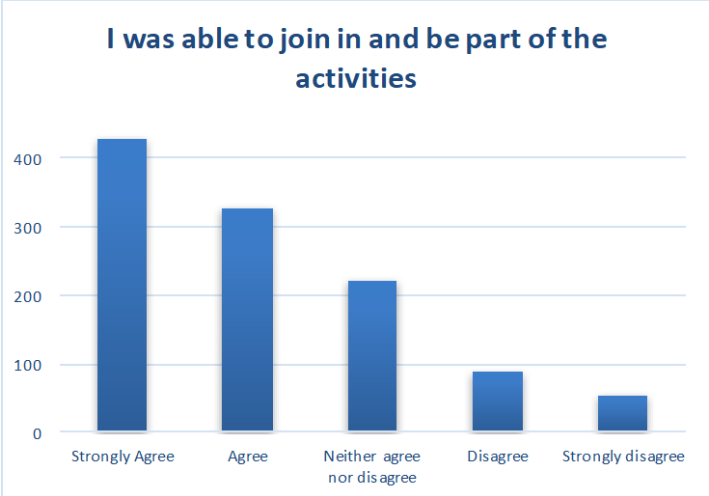

Table 52. Outreach students' ratings of how able they felt to join in (n=1,120)

How did the activities make you feel? I was able to join in and be part of the activities						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Total
Primary	235	166	64	32	20	517
Secondary	193	163	158	56	33	603
Female	226	156	97	49	18	546
Male	195	167	120	37	30	549
Other	7	6	5	2	5	25
More deprived	109	101	69	30	25	334
Less deprived	43	54	31	13	3	144

Overall, students reported that they were able to join in and be part of the activity (68%), while 13% of them disagree or strongly disagree with this claim. Statistical differences in the responses were found when compared with responses from primary and secondary students. Specifically, primary students felt more able to join in the activity ('Strongly agree' + 'Agree': 77%) than secondary students (59%). Additionally, differences in the responses between primary female students and primary male students were found. Namely, primary female students are, overall, more positive in their responses than primary male students. The following table shows the results for the statistical test for the different groups.

Table 53. Outreach students' ratings of how able they felt to join in (n=1,120)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	517	Yes	5.66	1118	0
		Secondary	603				
	Gender	Female	546	No	-1.755	1092.592	0.08
		Male	549				
	IMD	More deprived	334	No	-1.074	476	0.283
		Less deprived	144				
Primary student responses	Gender	Female	260	Yes	-2.316	505.079	0.021
		Male	257				
	IMD	More deprived	204	No	-1.351	249	0.178
		Less deprived	47				
Secondary student responses	Gender	Female	286	No	-0.266	574.476	0.791
		Male	292				
	IMD	More deprived	130	No	-1.776	220.807	0.077
		Less deprived	97				

Question 6: Will you tell your friends and family about these activities?

This question was answered by 1,209 students (596 females, 587 males, 26 other). From primary students, 595 answers were collected, therefore 614 answers corresponded to secondary students. In terms of the IMD, 371 answers came from students attending schools within the first IMD quintile (more deprived), while 153 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Will you tell your friends and family about these activities?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 25. Outreach students' ratings of how likely they would be to tell friends and family (n=1,209)

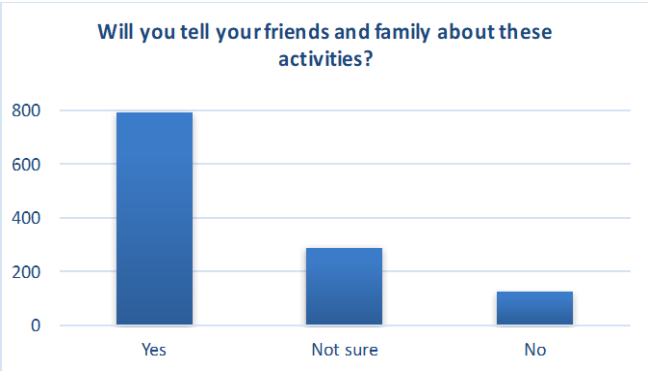

Table 54. Outreach students' ratings of how likely they would be to tell friends and family (n=1,209)

Will you tell your friends and family about these activities?				
Groups	Yes	Not sure	No	Total
Primary	445	124	26	595
Secondary	349	163	102	614
Female	416	125	55	596
Male	367	156	64	587
Other	11	6	9	26
More deprived	223	96	52	371
Less deprived	96	42	15	153

Overall, students reported that they would tell their friends and family about these activities (66%). When examining the responses between groups, various differences were found. Firstly, primary students were more positive (75%) about sharing these activities with family and friends than secondary students (57%). Similarly, female students were more positive (70%) in comparison with male students (63%). This trend is similar within primary, where 82% of the primary female students responded positively to this question while only 68% of the male primary students responded the same. Students from schools with lower IMD were slightly more positive in their responses (62%) than those from schools with higher IMD (60%). The following table shows the results for the statistical test for the different groups.

Table 55. Outreach students' ratings of how likely they would be to tell friends and family (n=1,209)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	595	Yes	4.896	1207	0
		Secondary	614				
	Gender	Female	596	Yes	-2.617	1181	0.009
		Male	587				
	IMD	More deprived	371	No	-0.126	277.179	0.9
		Less deprived	153				
Primary student responses	Gender	Female	299	Yes	-3.621	593	0
		Male	296				
	IMD	More deprived	239	No	1.328	289	0.185
		Less deprived	52				
Secondary student responses	Gender	Female	297	No	-0.245	585.202	0.806
		Male	291				
	IMD	More deprived	132	Yes	-2.644	208.8	0.009
		Less deprived	101				

Question 9: Have you used this type of equipment before at your school?

This question was answered by 1,151 students (574 females, 554 males, 23 other). From primary students, 583 answers were collected, therefore 554 answers corresponded to secondary students. In terms of the IMD, 347 answers came from students attending schools within the first and second IMD quintile (more deprived), while 148 answers come from students attending schools within the fourth and fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Have you used this type of equipment before at your school?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 26. Outreach students' ratings of whether they had used the equipment in school (n=1,151)

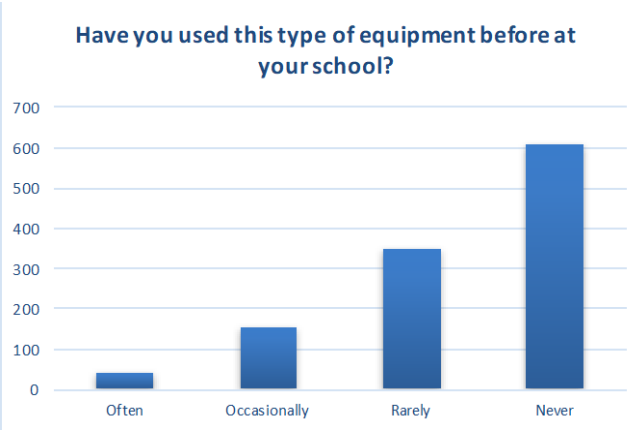

Table 56. Outreach students' ratings of whether they had used the equipment in school (n=1,151)

Have you used this type of equipment before at your school?					
Groups	**Often**	**Occasionally**	**Rarely**	**Never**	**Total**
Primary	23	46	151	363	583
Secondary	19	109	195	245	568
Female	18	80	178	298	574
Male	24	70	163	297	554
Other	0	5	5	13	23
More deprived	13	46	102	186	347
Less deprived	6	27	43	72	148

Overall, more than 52% of students reported that they had not used this type of equipment before, while around 30% of them reported that they had rarely used this equipment before. As might be expected, significant differences were found between primary and secondary students, where the amount of primary students that reported to have never used this equipment before (62%) is greater than secondary students (43%) that reported the same. The following table shows the results for the statistical test for the different groups.

Table 57. Outreach students' ratings of whether they had used the equipment in school (n=1,151)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	583	Yes	-5.982	1140.3	0
		Secondary	568				
	Gender	Female	574	No	-0.12	1120.608	0.904
		Male	554				
	IMD	More deprived	347	No	-1.23	265.675	0.22
		Less deprived	148				
Primary student responses	Gender	Female	294	No	0.138	578.966	0.89
		Male	289				
	IMD	More deprived	233	No	-0.659	76.198	0.512
		Less deprived	50				
Secondary student responses	Gender	Female	280	No	-0.224	538.626	0.823
		Male	265				
	IMD	More deprived	114	No	0.19	210	0.85
		Less deprived	98				

Question 11: Do you think your experience today will help you with school science classes?

This question was answered by 1,137 students (566 females, 548 males, 23 other). From primary students, 576 answers were collected, therefore 561 answers corresponded to secondary students. In terms of the IMD, 343 answers came from students attending schools within the first IMD quintile (more deprived), while 147 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Do you think your experience today will help you with school science classes?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 27. Outreach students' ratings of whether the activities would help with science classes (n=1,137)

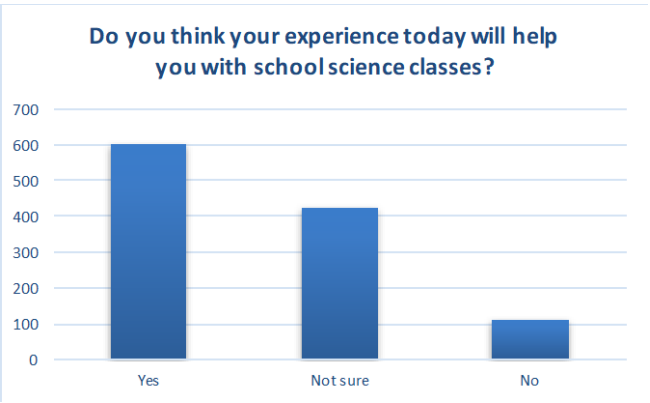

Table 58. Outreach students' ratings of whether the activities would help with science classes (n=1,137)

Do you think your experience today will help you with school science classes?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Primary	361	183	32	576
Secondary	240	243	78	561
Female	289	232	45	566
Male	300	188	60	548
Other	12	6	5	23
More deprived	191	112	40	343
Less deprived	79	57	11	147

More than 52% of students reported that they thought this experience would help them in school science classes, around 37% reported that they were not sure about it, whereas about 10% reported that they did not think that these activities would help them within science school classes. While analysing the differences between groups, mainly two groups responded differently. Differences were found between primary and secondary students; primary students were more positive (63%) regarding the usefulness of this activity in relation to their science school classes while secondary students are less sure of that (positive answer = 43%). Similarly, students from schools with lower IMD were more positive in this respect (57%) than students from schools with higher IMD (51%). The following table shows the results for the statistical test for the different groups.

Table 59. Outreach students' ratings of whether the activities would help with science classes (n=1,137)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	576	Yes	5.727	1133.732	0
		Secondary	561				
	Gender	Female	566	No	1.842	1112	0.066
		Male	548				
	IMD	More deprived	343	No	0.869	265.676	0.386
		Less deprived	147				
Primary student responses	Gender	Female	291	No	0.716	574	0.474
		Male	285				
	IMD	More deprived	234	No	0.462	67.446	0.645
		Less deprived	49				
Secondary student responses	Gender	Female	275	No	1.896	535.414	0.058
		Male	263				
	IMD	More deprived	109	No	-0.941	205	0.348
		Less deprived	98				

Question 12: Did the activities today make you feel…

This question was answered by 1,002 students (497 females, 482 males, 23 other). From primary students, 477 answers were collected, therefore 525 answers corresponded to secondary students. In terms of the IMD, 288 answers came from students attending schools within the first IMD quintile (more deprived), while 145 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did the activities today make you feel…'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 28. Outreach students' ratings of how the activities made them feel (n=1,002)

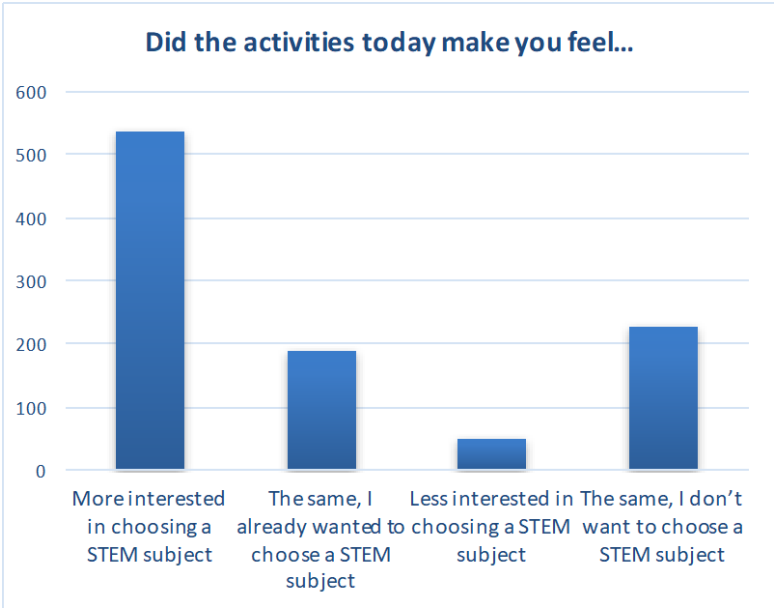

Table 60. Outreach students' ratings of how the activities made them feel (n=1,002)

Did the activities today make you feel...					
Groups	More interested in choosing a STEM subject	The same, I already wanted to choose a STEM subject	The same, I don't want to choose a STEM subject	Less interested in choosing a STEM subject	Total
Primary	305	80	20	72	477
Secondary	231	109	31	154	525
Female	254	79	28	136	497
Male	274	109	18	81	482
Other	8	1	5	9	23
More deprived	142	51	21	74	288
Less deprived	75	34	6	30	145

Overall, students reported being more interested in choosing a STEM subject than before the activity (53%). Statistical differences were found when comparing primary/secondary students' responses and female/male responses. Primary students were significantly more interested (64%) in choosing a STEM subject due to the activity than secondary students (44%). Similarly, male students were more interested (57%) than female students after the activity (51%). This difference between the responses of female and male students is more noticeable when comparing positives; male students were more positive (more interested in choosing a STEM subject after the activity + the same, 'I already wanted to choose a STEM subject' = 80%) than female students (more interested in choosing a STEM subject

after the activity and those who wanted from before the activity to choose a STEM subject = 66%). Additionally, when comparing responses within secondary students, significant differences between female and male responses were found. Thus, secondary male students were more interested in choosing a STEM subject (50%) after the activity than secondary female students (39%). Students who attended schools with lower IMD were slightly more interested in choosing a STEM subject (52%) after the activity than secondary students from schools with higher IMD (49%). The following table shows the results for the statistical test for the different groups.

Table 61. Outreach students' ratings of how the activities made them feel (n=1,002)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	477	Yes	6.31	1000	0
		Secondary	525				
	Gender	Female	497	Yes	3.331	977	0.001
		Male	482				
	IMD	More deprived	288	No	-1.367	431	0.172
		Less deprived	145				
Primary student responses	Gender	Female	241	No	1.079	475	0.281
		Male	236				
	IMD	More deprived	190	No	0.083	80.91	0.934
		Less deprived	50				
Secondary student responses	Gender	Female	256	Yes	3.565	500	0
		Male	246				
	IMD	More deprived	98	Yes	-3.912	190.418	0
		Less deprived	95				

Question 13: Did the activities today make you feel about a career in STEM

This question was answered by 1,043 students (521 females, 499 males, 23 other). From primary students, 530 answers were collected, and 513 answers collected corresponded to secondary students. In terms of the IMD, 304 answers came from students attending schools within the first IMD quintile (more deprived), while 145 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did the activities today make you feel that…'. This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 29. Outreach students' ratings of how the activities made them feel (n=1,043)

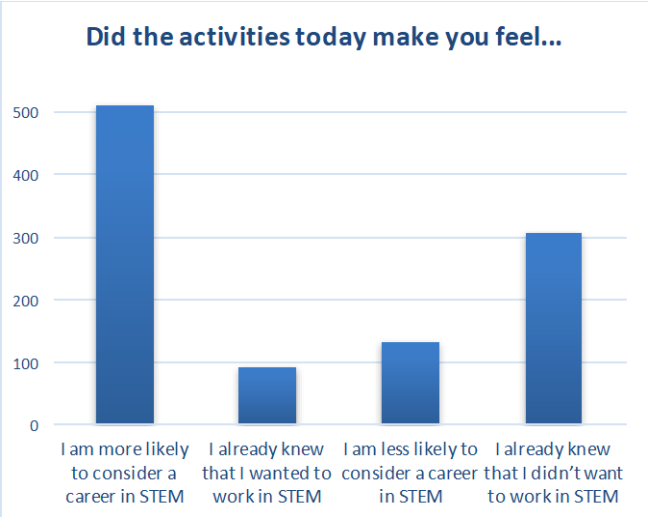

Table 62. Outreach students' ratings of how the activities made them feel (n=1,043)

Did the activities today make you feel...					
Groups	I am more likely to consider a career in STEM	I already knew that I wanted to work in STEM	I am less likely to consider a career in STEM	I already knew that I didn't want to work in STEM	Total
Primary	291	35	78	126	530
Secondary	218	58	56	181	513
Female	236	38	71	176	521
Male	267	54	60	118	499
Other	6	1	3	13	23
More deprived	144	21	44	95	304
Less deprived	65	16	16	48	145

Overall, almost 58% of students reported that they were more likely to consider a career in STEM or already knew that they wanted to work in STEM. There were significant differences in the responses of the three groups. Thus, primary students were significantly more positive (55%) about considering a career in STEM than secondary students (42%) after the activity. Similarly, male students were significantly more positive (57%) about considering a career in STEM than female students (51%) after the activity. Students from schools with higher IMDs were more positive (47%) about this question than students who came from schools with lower IMDs (45%). The following table shows the results for the statistical test for the different groups.

Table 63. Outreach students' ratings of how the activities made them feel (n=1,043)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	530	Yes	4.997	1041	0
		Secondary	513				
	Gender	Female	521	Yes	3.06	1018	0.002
		Male	499				
	IMD	More deprived	304	No	0.771	280.606	0.441
		Less deprived	145				
Primary student responses	Gender	Female	271	No	0.142	527.091	0.887
		Male	259				
	IMD	More deprived	211	No	0.992	259	0.322
		Less deprived	50				
Secondary student responses	Gender	Female	250	Yes	4.239	488	0
		Male	240				
	IMD	More deprived	93	No	-1.883	185.808	0.061
		Less deprived	95				

Question 14: Did you know that the UK did this sort of research before today?

This question was answered by 1,067 students (533 females, 512 males, 22 other). From primary students, 546 answers were collected, therefore 521 answers corresponded to secondary students. In terms of the IMD, 322 answers came from students attending schools within the first IMD quintile (more deprived), while 144 answers came from students attending schools within the fifth IMD quintile (less deprived).

The next figure shows the overall distribution of the responses for the question 'Did you know that the UK did this sort of research before today?' This figure is followed by a table with the percentage for each answer within three groups: Level (primary/secondary); Gender (female/male); and, IMD (lower IMD/higher IMD).

Figure 30. Outreach students' ratings of whether they were aware of the research in the UK activities (n=1,067)

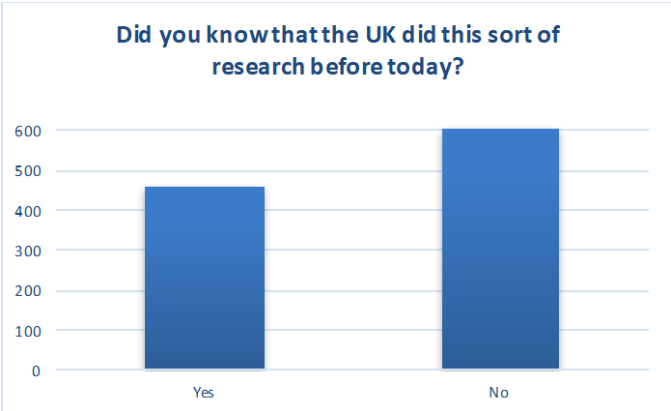

Table 64. Outreach students' ratings of whether they were aware of the research in the UK activities (n=1,067)

Did you know that the UK did this sort of research before today?			
Groups	**Yes**	**No**	**Total**
Primary	209	337	546
Secondary	252	269	521
Female	213	320	533
Male	235	277	512
Other	13	9	22
More deprived	112	210	322
Less deprived	66	78	144

Overall, 43% of the students knew that the UK did this type of research before the activity. Great differences were found when comparing the responses between groups. Thus, secondary students were significantly more aware of this information (48%) than primary students (38%). Similarly, male students were more aware (56%) than female students (40%). Students from schools with lower IMDs were more knowledgeable about this information (46%) than students who attended schools with higher IMDs (35%). The following table shows the results for the statistical test for the different groups.

Table 65. Outreach students' ratings of whether they were aware of the research in the UK activities (n=1,067)

Sample	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Total sample	Level	Primary	546	Yes	-3.34	1065	0.001
		Secondary	521				
	Gender	Female	533	No	1.94	1043	0.053
		Male	512				
	IMD	More deprived	322	Yes	-2.276	464	0.023
		Less deprived	144				
Primary student responses	Gender	Female	278	No	-0.103	543.348	0.918
		Male	268				
	IMD	More deprived	224	Yes	-3.213	271	0.001
		Less deprived	49				
Secondary student responses	Gender	Female	255	Yes	2.91	495.522	0.004
		Male	244				
	IMD	More deprived	98	No	0.673	190.918	0.502
		Less deprived	95				

Qualitative analysis of student evaluation form

This section analysed the responses of the open-ended questions from all three student questionnaires. All three questionnaires include the same five independent open-ended questions, and two of the same open-ended questions that are a follow up of a multiple-choice question (a 'why' question).

The analysis considers all the responses from each question given by the three main groups of students (bursary, career-event, outreach students). This analysis focuses on the recognition of patterns across the data set that are important to understand the answers of the question in relationship with the programme.

The analysis will be presented as follows: for each question, a description of the respondent groups is provided. Then, a description of the themes that emerged from the thematic analysis is offered along with some representative examples of those themes.

Question 7: what did you like the most about the activities?

This question was answered by 2,391 students (905 from bursary student questionnaire, 334 from career-event student questionnaire, 1152 outreach student questionnaire). Similar number of responses were received from females and males. There were more responses from secondary students (57%) than primary students (43%). There are greater number of responses of students who attended more deprived schools (61%) than less deprived schools (39%).

Most of the responses were enthusiastic and very positive about the activities. When students commented about what they liked the most, three themes emerged: 1) the possibility of learning new and interesting things, 2) working in groups and participating in the activity, and 3) the equipment. Many students indicated that they had fun within the activity overall, for example: 'All of it. I can't choose it was fun'.

More examples are as follows:

1) The possibility of learning new and interesting things;
   - 'A lot of the stuff we did was quite interesting'
   - 'That I learnt new stuff'
2) Working in groups and participating in the activity;
   - 'They were fun and I worked with some friends'
   - 'Balloon and group work'
   - 'Being able to have a chance to try new things'
   - 'I loved the interacting - everyone got involved'
3) The equipment
   - 'Being able to play with different equipment'
   - 'Planetarium'
   - 'The plasma ball was my favourite because it looked really cool when I touched it'

Question 8: What were the two things (bits of knowledge, or experiences) that you think you'll most remember from these activities?

This question was answered by 2,198 students (841 from bursary student questionnaire, 305 from career-event student questionnaire, 1052 outreach student questionnaire). A similar number of responses was received from females and males. There were more responses from secondary students (57%) than primary students (43%). There are a greater number of responses from students who attended more deprived schools (61%) than less deprived schools (39%).

When students commented about what they will remember the most about these activities, four themes emerged: 1) shocking facts; facts that are strongly related with the students own life or interest, 2) attitudes; students reported that they will remember some attitudes or ways to approach

new knowledge, 3) experimenting; most students mentioned either the name of the equipment that they saw/used or having to interact with some equipment, and 4) School scientific knowledge; some common observations that students discussed were related with scientific knowledge which they could link with school science (atoms, circuits, etc).

Examples:

1) shocking facts
   - 'science gave us the world wide web'
   - 'many thigs are fabricated in Edinburg'
   - 'That the electric through your body'
   - 'That I held a 4 billion year old rock'
2) Attitudes
   - 'You don't always get the results you expect in science'
   - 'Being creative and expressing my creative knoledge (sic)'
3) Experimenting
   - 'Experiences with magnet'
   - 'Experiencing the lightening.'
   - 'Van de figure generator'
4) School scientific knowledge
   - 'atoms, frictions'
   - 'Atoms are mostly empty space.
   - 'blue meens the stars are the hottiset and red meens the stars are coldisese.'

Question 10: In what ways, if any, are these activities different from the science lessons you do in school?

This question was answered by 1,850 students (663 from bursary student questionnaire, 268 from career-event student questionnaire, 819 outreach student questionnaire). A similar number of responses was received from females and males. There were more responses from secondary students (59%) than primary students (41%). There are a greater number of responses from students who attended more deprived schools (62%) than less deprived schools (38%).

Most students reported that the activities, as they were done, are quite different from their science lesson in their schools. The major distinction found by students is the difference in the equipment - 'better technology'. Additionally, students focus on the level of interactivity built within these activities - 'it was more hands on'. Another theme is the engagement of the activities; students are very positive towards the type of activities that were offered in the programme.

Examples:

1) The equipment
   - 'because our school hasn't got the equipment'
   - 'We don't have the fancy equipment :(and that makes it less interesting'
   - 'Activities at school are less technical'
2) Interactivity and practical
   - 'it was more hands on'
   - 'All we do in class is read and write'

- ‘A lot of practicals’

3) Engagement of the activities
   - ‘The activities were more weird... cooler’
   - ‘in our science lessons, they wasn't really exciting’
   - ‘It was more fun here’

Within these answers some students think that there are not many differences between the science in the classroom with the one offered by the programme: ‘these activities are similar to what you learn in school but you learn more with the equipment’ or ‘It's not that different but I would say it was more fun’.

Question 15: What do you think of this research?

This question was answered by 1,940 students (794 from bursary student questionnaire, 296 from career-event student questionnaire, 850 outreach student questionnaire). A similar number of responses were received from females and males. There were more responses from secondary students (58%) than primary students (42%). There are a greater number of responses from students who attended more deprived schools (63%) than less deprived schools (37%).

Most of the answers were positive. Within these answers two themes emerged, 1) positive feelings; students feel positive towards the research, and 2) relevance of the research; students mentioned the importance of the research today.

Examples:

1) Positive feelings
   - ‘amazing and interesting’
   - ‘It is crazy how it is real’
   - ‘inspiring’
2) Relevance of the research
   - ‘It is quite interesting and critical to modern life’
   - ‘It's a great thing for the UK to be involved in’
   - ‘cutting edge/entrancing’

Some of the students were disappointed with the research, for example, they reported ‘Boring but cool’ or ‘Nothing much’.

The following two questions correspond to a follow-up query from a multiple-choice question.

Question 6b: Will you tell your friends and family about these activities? Why?

This question was answered by 2,195 students (795 from bursary student questionnaire, 296 from career-event student questionnaire, 915 outreach student questionnaire). There are slightly more responses from female students (51%) than male students (49%). Similarly, there were more responses from secondary students (60%) than primary students (40%). And, there are greater number of responses of students who attended more deprived schools (61%) than less deprived schools (39%).

When students were asked whether they would tell their families and friends about these activities, even though positive responses were found in all three groups of students (bursary, Career-Event and Outreach students), differences were notorious. Thus, within bursary student questionnaire 75% of students gave a positive answer, similarly within career event student questionnaire (82%). The lower percentage of positive answers were within the outreached questionnaire, in which only 66% of students gave a positive answer.

Reasons for telling family and friends are similar in all questionnaires. Overall, students are very enthusiastic about these activities, three themes can be identified, 1) sharing knowledge, 2) inspiration and participation, 3) future opportunities to visit the science centre.

Examples:

1) Sharing knowledge
   - 'Because I learnt new things'
   - 'It's a good learning moment that should be shared'
   - 'I felt like it helped me learn about UV, infrared and magnetisim'
2) Inspiration and participation
   - 'because it was fun and amazing and also inspiring'
   - 'because it wasn't fun and you didn't let everyone join in'
   - 'A lot of practical Im telling my family about this because it taught me loads about science and it kinda inspired me'
3) Opportunities to visit the science centre
   - 'Because this is a good place to visit as they might like it'
   - 'Because i might get them to go and i want to come again'
   - 'Because I want to tell them how good the Science Centre is'

Reason for not telling or being unsure whether to tell friends and family about the activity is disinterest; either from the student or their parents: 'Because I'm not really into science', 'They wouldn't be interested', 'Because they won't care', 'Because I am not a big fan of science'.

Question 11b: Do you think your experience today will help you with school science classes? Why?

This question was answered by 1,650 students (671 from bursary student questionnaire, 244 from career-event student questionnaire, 735 from outreach student questionnaire). There are slightly more responses from female students (51%) than male students (49%). Similarly, there were more responses from secondary students (61%) than primary students (39%). And, there are a greater number of responses of students who attended more deprived schools (62%) than less deprived schools (38%).

This is a follow up enquiry for a multiple-choice question: Do you think your experience today will help you with school science classes? Positive answers for this question rank between 52% and 60%. Within two questionnaires primary students were significantly more positive about this question. This is reflected in answers such us: 'Because the activities had stuff that would be in secondary school'.

Most of the students that answered positively to this question alluded to the fact that they have learnt 'a lot' or were 'learning new things'. The emphasis on these comments are placed on three aspects 1) the content might appear in school, 2) good explanations and 3) the fun associated with the activities.

Examples:

1) Content that might be in school
   - 'Because it is like the science we use in school but a lot more electric and light and power'
   - 'bcause I will use it in high school'
   - 'it's our next topic'
2) Good explanations
   - 'because the people were good at explaining it'
   - 'Things seemed more real and were easier to understand'
   - 'I understand things more'
3) The fun
   - 'Because he made it fun to remember'
   - 'because facts are cool'

Students that answer this question negatively or are unsure allude to the fact that they already have seen these topics in school, they cannot relate what they did in these activities with school science or they did not understand;

Examples:

4) Content seen in the classroom before
   - 'Because I already knew most of it'
   - 'Depends on the lesson and the topic'
   - 'because I already know'
5) No relationship between the activity and school science
   - 'because we don't do this'
   - 'School does basic practicals. Maybe it'll help later in life'
   - 'As it is different to the things we learn in class'
6) Not understanding
   - 'because I just don't understand'
   - 'as I didn't understand some of the words'
   - 'We don't know what we're doing'

Question 16: Do you have any other comments or suggestions that you'd like to share with us?

This last question was answered by 1,406 students. Most comments were positive, comments such as 'amazing', 'cool', 'You explained well so we could understand more'… etc. Among suggestions, there were no specific themes that emerged but some of the suggestions that could be representative are: some asked for more experiments of topics, 'More about the camera', 'put black holes in', some have to do with the fact that everyone wants to join in and touch - 'I loved your activities but it would be more fun if we joined in.' 'try to make more activities for 3-8 year olds'

Appendix 2: Teacher Questionnaires

Results and analysis of the teacher questionnaires

Results and analysis of two evaluation forms are presented in this section: 1) School and Event teacher questionnaire, which were answered by teachers that took their students to the centre, and 2) Teacher CPD Questionnaire, which was answered by teachers who participated in a continuous professional development in the programme.

The results and quantitative analysis for each multiple-choice question within each questionnaire will be presented as follows: overview of the responses followed by the analysis of the responses. The overview of the responses includes a brief paragraph with a summary of the respondents' group, followed by a figure with the distribution of the responses and a table which includes a detail of how the main groups answered the question. The analysis of the responses looks at whether the responses from teachers who worked in less deprived schools is different than teachers who worked in more deprived school. In the same way, differences in the responses from teachers visiting a centre is different from those that are visited by a centre.

School and Event Teacher Questionnaire

A total of 129 teachers participated in the evaluation of these activity from nine science centres.

Table 66. Teachers participating in EYU events (n=129)

	Teacher questionnaire: For today's activities, were you:				
Science Centre	Visited by a science centre?	Visiting a science centre?	Neither of the above	N/I	Total responses
Aberdeen Science Centre	6	7			13
Cambridge Science Centre	15	13	10	1	39
Dundee Science Centre	6				6
Dynamic Earth		3			3
Techniquest	10				10
Techniquest Glyndwr	8	8	7		23
The Observatory Science Centre	21				21
W5	4	3	1		8
Winchester Science Centre	6				6
Total	76	34	18		129

Question 5: How would you rate the activities overall?

This question was answered by 128 teachers (76 visited by a centre, 36 visiting a centre, 19 other). From more deprived schools, 57 teachers answered the questionnaire, while 43 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 30. Teachers' overall ratings of the events (n=1,128)

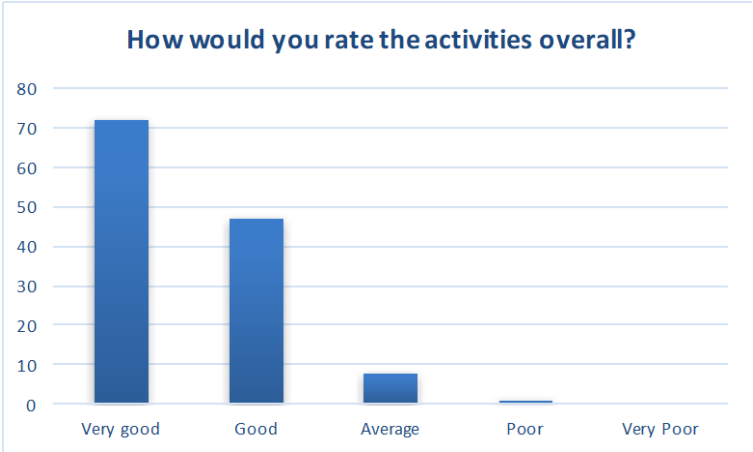

Table 67. Teachers' overall ratings of the events (n=1,128)

How would you rate the activities overall?						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Visited by a science centre?	48	27	0	0	1	76
Visiting a science centre?	18	10	5	0	0	33
Other	6	10	3	0	0	19
Lower IMD	35	21	1	0	0	57
Higher IMD	22	16	5	0	0	43

Most of the teachers (93%) gave a positive evaluation of the activity while less than 1% gave a negative evaluation. No statistical differences were found between teachers' responses from those who went to a science centre for the activity than those that were visited by a centre. Neither were differences found between the responses of teachers who worked in less deprived schools and those who worked in more deprived schools. The following table shows the results for the statistical test (T-test).

Table 68. Teachers' overall ratings of the events (n=1,128)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How would you rate the activities overall?	IMD	Lower IMD	57	No	1.643	98	0.104
		Higher IMD	43				
		Visited by a science centre	76	No	1.328	53.057	0.19
		Visiting a science centre	33				

Question 6: How would you rate the following aspects of today's activities?

a) The content of the workshop

This question was answered by 129 teachers (76 visited by a centre, 34 visiting a centre, 19 other). From more deprived schools, 57 teachers answered the questionnaire, while 44 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 31. Teachers' ratings of the content of events (n=129)

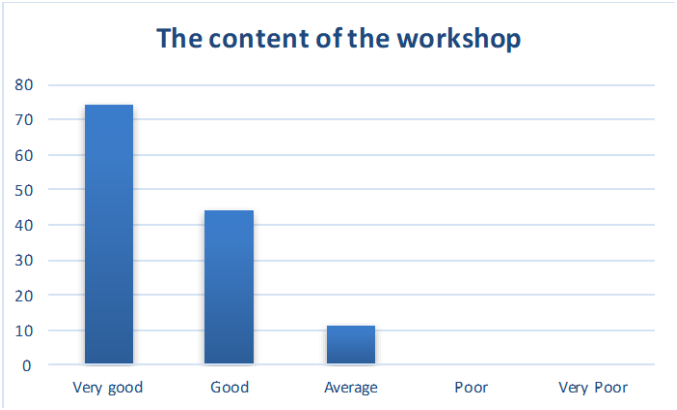

Table 69. Teachers' ratings of the content of events (n=129)

How would you rate the following aspects of today's activities? The content of the workshop						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Visited by a science centre?	51	24	1	0	0	76
Visiting a science centre?	16	12	6	0	0	34
Other	7	8	4	0	0	19
Lower IMD	38	17	2	0	0	57
Higher IMD	19	17	8	0	0	44

Most of the teachers asked had a positive evaluation of the content of the activity (91%). Statistical differences were found between teachers' responses. Specifically, teachers that were visited by a science centre were more positive about the content of the activity (very good = 67%) than those that went to a science centre for the activity (very good = 50%). Similarly, teachers who worked in schools with lower IMD were more positive in this question (very good = 67%) than those who worked in less deprived schools (very good = 43%). The following table shows the results for the statistical test for the different groups.

Table 70. Teachers' ratings of the content of events (n=129)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
The content of the workshop	IMD	Lower IMD	57	Yes	2.936	99	0.004
		Higher IMD	44				
		Visited by a science centre	76	Yes	2.966	108	0.004
		Visiting a science centre	34				

b) The equipment provided

Figure 32. Teachers' ratings of the equipment used at events (n=129)

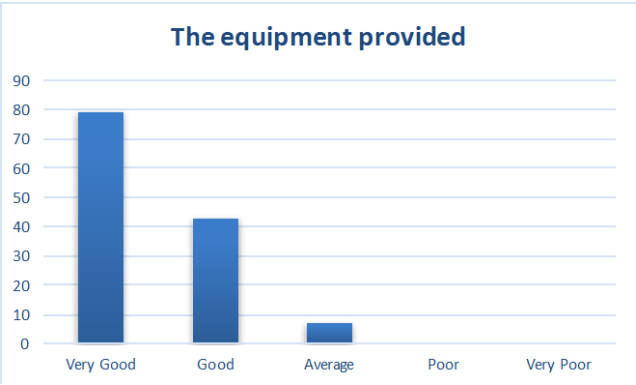

Table 71. Teachers' ratings of the equipment used at events (n=129)

How would you rate the following aspects of today's activities? The equipment provided						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Visited by a science centre?	54	20	2	0	0	76
Visiting a science centre?	16	15	3	0	0	34
Other	9	8	2	0	0	19
Lower IMD	38	19	0	0	0	57
Higher IMD	22	16	6	0	0	44

Most teachers had a positive evaluation of the equipment provided for the activity (95%). Statistical differences were found between teachers' responses. Specifically, teachers who were visited by a science centre were more positive about the equipment (very good = 71%) than those who went to a science centre for the activity (very good = 47%). Similarly, teachers who work in more deprived schools were more positive in this aspect (very good = 67%) than those who work in less deprived schools (very good = 50%). The following table shows the results for the statistical test for the different groups.

Table 72. Teachers' ratings of the equipment used at events (n=129)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
The equipment provided	IMD	Lower IMD	57	Yes	2.545	99	0.012
		Higher IMD	44				
		Visited by a science centre	76	Yes	2.59	108	0.011
		Visiting a science centre	34				

c) The expertise of staff running the workshop

This question was answered by 129 teachers (76 visited by a centre, 34 visiting a centre, 19 other). From more deprived schools, 57 teachers answered the questionnaire, while 44 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers worked in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 33. Teachers' ratings of the expertise of the centre staff (n=129)

Table 73. Teachers' ratings of the expertise of the centre staff (n=129)

How would you rate the following aspects of today's activities? The expertise of staff running the workshop						
Groups	**Very good**	**Good**	**Average**	**Poor**	**Very Poor**	**Total**
Visited by a science centre?	63	13	0	0	0	76
Visiting a science centre?	20	14	0	0	0	34
Other	11	8	0	0	0	19
Lower IMD	45	12	0	0	0	57
Higher IMD	28	16	0	0	0	44

All teachers had a positive evaluation of the experience of the staff running the workshop (100%). Statistical differences were found between teachers' responses when comparisons were done according to IMD. Specifically, teachers who worked in schools with lower IMD were more positive in this question (very good = 79%) than those who worked in less deprived schools (very good = 64%). The following table shows the results for the statistical test for the different groups.

Table 74. Teachers' ratings of the expertise of the centre staff (n=129)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
The expertise of staff running the workshop	IMD	Lower IMD	57	No	1.712	99	0.09
		Higher IMD	44				
		Visited by a science centre	76	Yes	2.781	108	0.006
		Visiting a science centre	34				

Question 10: Will you talk about Explore Your Universe content with the students in the future?

This question was answered by 118 teachers (71 visited by a centre, 30 visiting a centre, 17 other). From schools within the first and second IMD quintile (more deprived schools), 50 teachers answered the questionnaire, while 41 responses came from teachers in schools within the fourth and fifth IMD quintile (less deprived schools).

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 34. Teachers' ratings of whether they would discuss the EYU activities with their students (n=118)

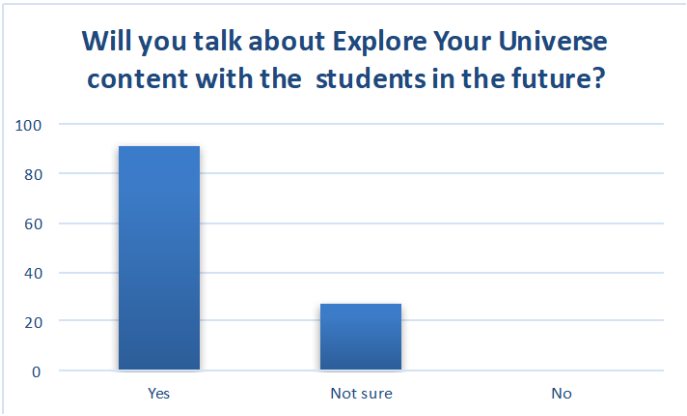

Table 75. Teachers' ratings of whether they would discuss the EYU activities with their students (n=118)

Will you talk about Explore Your Universe content with the students in the future?				
Groups	**Yes**	**Not sure**	**No**	**Total**
Visited by a science centre?	57	14	0	71
Visiting a science centre?	24	6	0	30
Other	10	7	0	17
Lower IMD	39	11	0	50
Higher IMD	33	8	0	41

Most teachers reported that they will talk about Explore your Universe content with their students in the future (77%). No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 76. Teachers' ratings of whether they would discuss the EYU activities with their students (n=118)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Will you talk about Explore Your Universe content with the students in the future?	IMD	Lower IMD	50	No	-0.289	86.804	0.774
		Higher IMD	41				
		Visited by a science centre	71	No	0.032	53.895	0.975
		Visiting a science centre	30				

Question 11: In terms of the content of today's activities, what will you do next?

a) 'I will use things I've learned on this day in the classroom'

This question was answered by 120 teachers (74 visited by a centre, 31 visiting a centre, 15 other). From more deprived schools, 50 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 35. Teachers' ratings of whether they would use what they have learned (n=120)

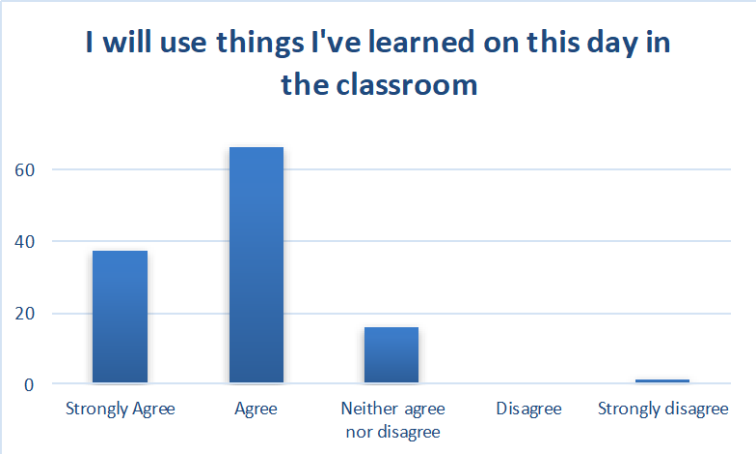

Table 77. Teachers' ratings of whether they would use what they have learned (n=120)

In terms of the content of today's activities, what will you do next? I will use things I've learned on this day in the classroom						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Visited by a science centre?	25	38	10	0	1	74
Visiting a science centre?	9	20	2	0	0	31
Other	3	8	4	0	0	15
Lower IMD	16	25	8	0	1	50
Higher IMD	11	26	5	0	0	42

Most teachers had a positive evaluation regarding the use of things that they had learned in the activity in their own classroom (86%). No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 78. Teachers' ratings of whether they would use what they have learned (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
I will use things I've learned on this day in the classroom	IMD	Lower IMD	50	No	-0.289	88.84	0.774
		Higher IMD	42				
		Visited by a science centre	74	No	-0.476	75.509	0.636
		Visiting a science centre	31				

b) 'I will try to find out more about these topics'

This question was answered by 117 teachers (72 visited by a centre, 30 visiting a centre, 15 other). From more deprived schools, 48 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 36. Teachers' views on whether they will research the topics covered (n=117)

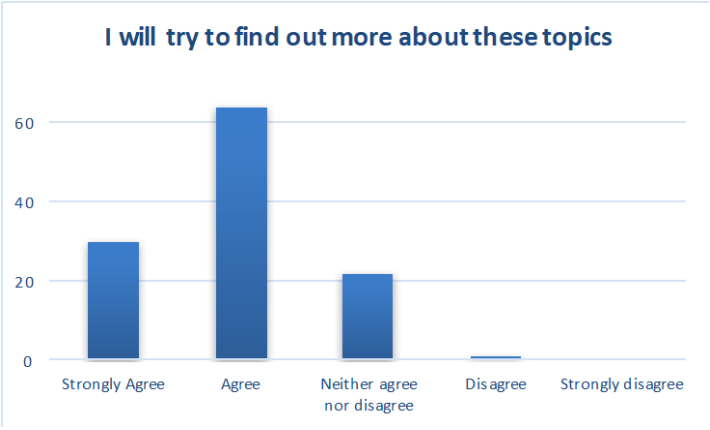

Table 79. Teachers' views on whether they will research the topics covered (n=117)

In terms of the content of today's activities, what will you do next? I will try to find out more about these topics						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Visited by a science centre?	21	40	10	1	0	72
Visiting a science centre?	8	14	8	0	0	30
Other	1	10	4	0	0	15
Lower IMD	14	29	4	1	0	48
Higher IMD	8	21	13	0	0	42

Most teachers reported that they will try to find out more about the topics seen in today's activity (83%). No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 80. Teachers' views on whether they will research the topics covered (n=117)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
I will try to find out more about these topics	IMD	Lower IMD	48	No	1.971	84.725	0.052
		Higher IMD	42				
		Visited by a science centre	72	No	0.79	50.961	0.433
		Visiting a science centre	30				

c) 'I will share what I have learnt during these activities with my colleagues'

This question was answered by 119 teachers (73 visited by a centre, 31 visiting a centre, 15 other). From more deprived schools, 50 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science

centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 37. Teachers' views on whether they will share what they have learned (n=119)

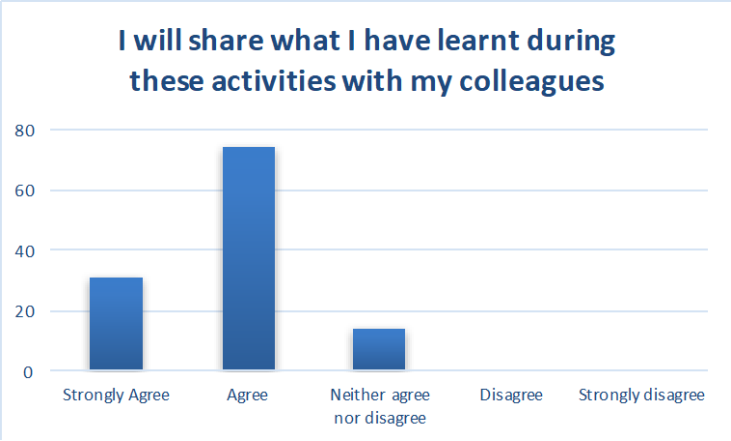

Table 81. Teachers' views on whether they will share what they have learned (n=119)

In terms of the content of today's activities, what will you do next? I will share what I have learnt during these activities with my colleagues						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Visited by a science centre?	20	43	10	0	0	73
Visiting a science centre?	6	24	1	0	0	31
Other	5	7	3	0	0	15
Lower IMD	12	33	5	0	0	50
Higher IMD	12	23	7	0	0	42

Most teachers reported that they will share what they have learnt during the activity with their colleagues (88%). No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 82. Teachers' views on whether they will share what they have learned (n=119)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
I will share what I have learnt during these activities with my colleagues	IMD	Lower IMD	50	No	0.16	81.11	0.874
		Higher IMD	42				
		Visited by a science centre	73	No	-0.221	77.533	0.826
		Visiting a science centre	31				

d) 'I will be interested in attending CPD on this topic'

This question was answered by 115 teachers (71 visited by a centre, 30 visiting a centre, 14 other). From more deprived schools, 48 teachers answered the questionnaire, while 41 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 38. Teachers' ratings of their interest in attending CPD (n=115)

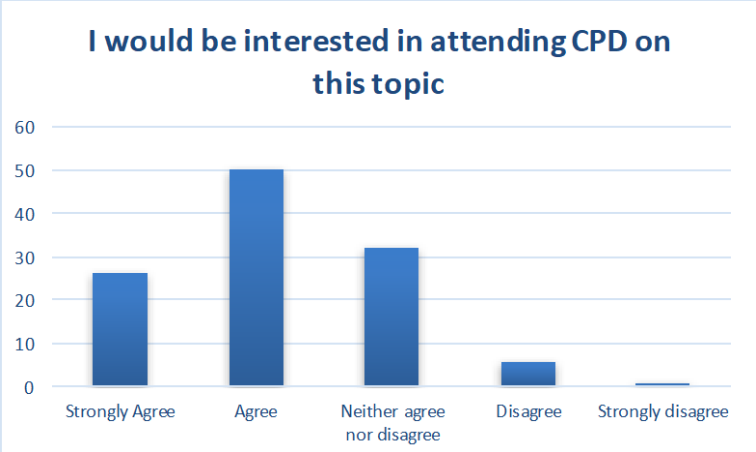

Table 83. Teachers' ratings of their interest in attending CPD (n=115)

In terms of the content of today's activities, what will you do next? I would be interested in attending CPD on this topic						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Visited by a science centre?	18	32	18	3	0	71
Visiting a science centre?	5	11	10	3	1	30
Other	3	7	4	0	0	14
Lower IMD	15	22	10	1	0	48
Higher IMD	5	19	13	3	1	41

Most teachers reported that they will be interested in attending CPD on this topic (66%) while 29% of them declared neither agree nor disagree with this option. A significant difference was found when comparing the responses according to the IMD. Specifically, teachers who worked in more deprived schools were more willing to attend a CPD on this topic (strongly agree = 31%) than those who worked in less deprived schools (strongly agree = 12%). The following table shows the results for the statistical test for the different groups.

Table 84. Teachers' ratings of their interest in attending CPD (n=115)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
I would be interested in attending CPD on this topic	IMD	Lower IMD	48	Yes	2.657	80.274	0.01
		Higher IMD	41				
		Visited by a science centre	71	No	1.834	46.15	0.073
		Visiting a science centre	30				

Question 12: Will you recommend these activities to other teachers?

This question was answered by 120 teachers (73 visited by a centre, 32 visiting a centre, 15 other). From more deprived schools, 50 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 39. Teachers' views on whether they would recommend the activities CPD (n=120)

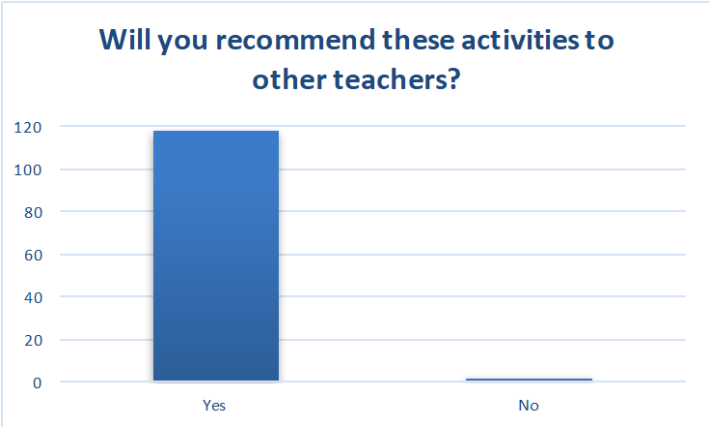

Table 85. Teachers' views on whether they would recommend the activities CPD (n=120)

Will you recommend these activities to other teachers?			
Groups	**Yes**	**No**	**Total**
Visited by a science centre?	71	2	73
Visiting a science centre?	32	0	32
Other	15	0	15
Lower IMD	50	0	50
Higher IMD	41	1	42

Most teachers reported that they will recommend these activities to other teachers (98%). No statistical differences were found between teachers' responses when the comparison was done

according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 86. Teachers' views on whether they would recommend the activities CPD (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Will you recommend these activities to other teachers?	IMD	Lower IMD	50	No	1.092	90	0.278
		Higher IMD	42				
		Visited by a science centre	73	No	-1.424	72	0.159
		Visiting a science centre	32				

Question 13: Had you heard of STFC before today?

This question was answered by 120 teachers (72 visited by a centre, 31 visiting a centre, 17 other). From more deprived schools, 51 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 40. Teachers' views on whether they had heard of STFC before (n=120)

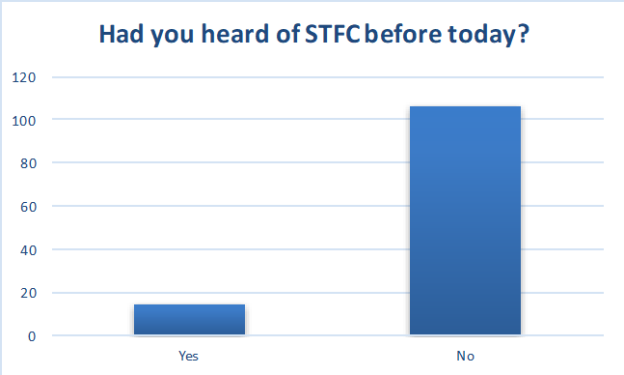

Table 87. Teachers' views on whether they had heard of STFC before (n=120)

Had you heard of STFC before today?			
Groups	Yes	No	Total
Visited by a science centre?	5	67	72
Visiting a science centre?	6	25	31
Other	3	14	17
Lower IMD	4	47	51
Higher IMD	5	37	42

Most teachers reported that they had not heard about STFC before the activity (88%). No statistical differences were found between teachers' responses when the comparison was done according to

IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 88. Teachers' views on whether they had heard of STFC before (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
Had you heard of STFC before today?	IMD	Lower IMD	51	No	-0.642	79.592	0.523
		Higher IMD	42				
		Visited by a science centre	72	No	-1.885	101	0.062
		Visiting a science centre	31				

Question 15: How likely is it that you would take your students to visit a science centre, with funding to cover all travel and entry costs?

This question was answered by 118 teachers (70 visited by a centre, 32 visiting a centre, 16 other). From schools more deprived schools, 48 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 41. Teachers' views on how likely it is that they would take students to a science centre in future (n=118)

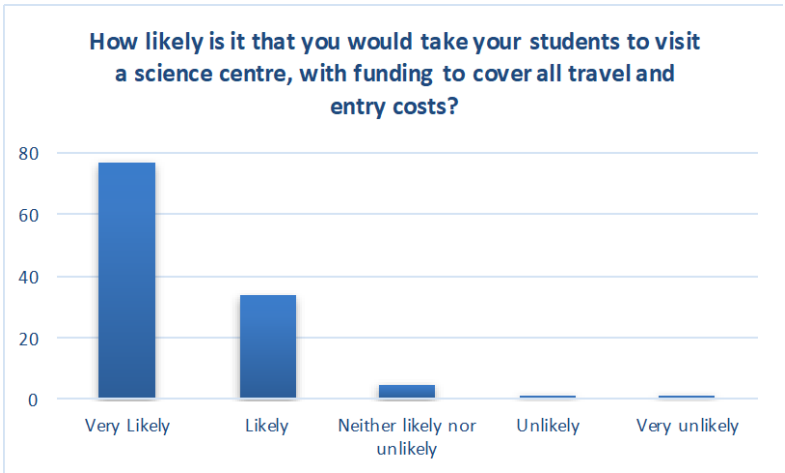

Table 89. Teachers' views on how likely it is that they would take students to a science centre in future (n=118)

How likely is it that you would take your students to visit a science centre, with funding to cover all travel and entry costs?						
Groups	Very Likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely	Total
Visited by a science centre?	46	20	2	1	1	70
Visiting a science centre?	23	7	2	0	0	32
Other	8	7	1	0	0	16
Lower IMD	33	12	1	1	1	48
Higher IMD	26	15	1	0	0	42

Most teachers reported that it was very likely or likely that they would take their students to visit a science centre in the future.

Table 90. Teachers' views on how likely it is that they would take students to a science centre in future (n=118)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How likely is it that you would take your students to visit a science centre, with funding to cover all travel and entry costs?	IMD	Lower IMD	48	No	-0.225	82.161	0.822
		Higher IMD	42				
		Visited by a science centre	70	No	-0.711	74.336	0.479
		Visiting a science centre	32				

Question 16: How likely is it that you would take your students to visit a science centre, without external funding to cover all travel and entry costs?

This question was answered by 120 teachers (70 visited by a centre, 32 visiting a centre, 18 other). From more deprived schools, 50 teachers answered the questionnaire, while 42 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 42. Teachers' views on how likely it is that they would take students to a science centre in future without external funding (n=120)

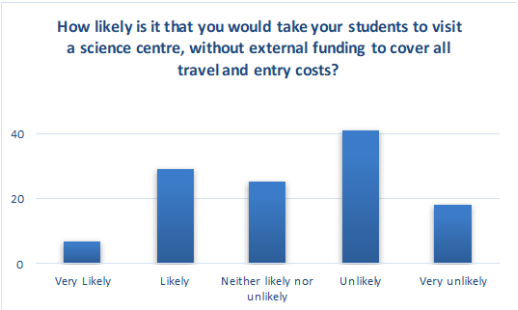

Table 91. Teachers' views on how likely it is that they would take students to a science centre in future without external funding (n=120)

How likely is it that you would take your students to visit a science centre, without external funding to cover all travel and entry costs?						
Groups	Very Likely	Likely	Neither likely nor unlikely	Unlikely	Very unlikely	Total
Visited by a science centre?	6	19	12	19	14	70
Visiting a science centre?	1	8	10	11	2	32
Other	0	2	3	11	2	18
Lower IMD	4	11	7	21	7	50
Higher IMD	0	13	12	14	3	42

Most teachers reported that it is very unlikely or unlikely that they would take their students to visit a science centre, without external funding to cover all the travel and entry cost (49%). Only 30% of them reported that would be likely or very likely that they would take their students to the science centre without external funding. No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 92. Teachers' views on how likely it is that they would take students to a science centre in future without external funding (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How likely is it that you would take your students to visit a science centre, without external funding to cover all travel and entry costs?	IMD	Lower IMD	50	No	-0.68	89.793	0.498
		Higher IMD	42				
		Visited by a science centre	70	No	-0.282	100	0.779
		Visiting a science centre	32				

Question 17: How likely is it that you would arrange a visit from a science centre to your school, with funding to cover all costs?

This question was answered by 120 teachers (70 visited by a centre, 32 visiting a centre, 18 other). From more deprived schools, 50 teachers answered the questionnaire, while 43 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 43. Teachers' views on how likely it is that they would organise a visit from a science centre in future should external funding be available (n=120)

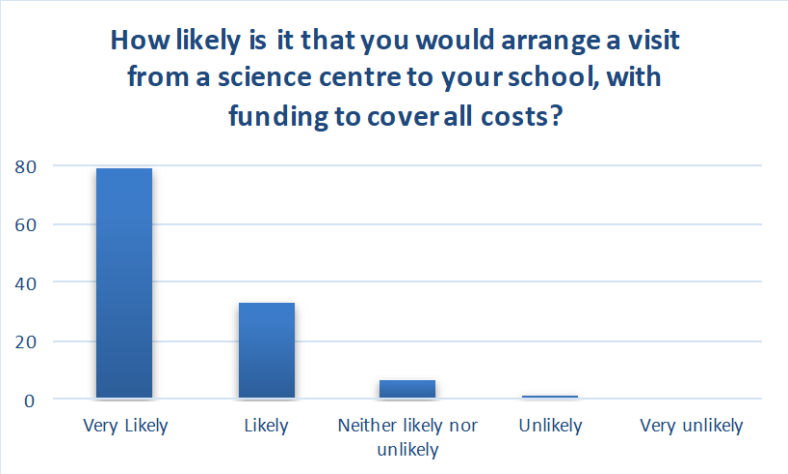

Table 93. Teachers' views on how likely it is that they would organise a visit from a science centre in future should external funding be available (n=120)

How likely is it that you would arrange a visit from a science centre to your school, with funding to cover all costs?						
Groups	**Very Likely**	**Likely**	**Neither likely nor unlikely**	**Unlikely**	**Very unlikely**	**Total**
Visited by a science centre?	49	17	3	1	0	70
Visiting a science centre?	20	9	3	0	0	32
Other	10	7	1	0	0	18
Lower IMD	35	12	3	0	0	50
Higher IMD	27	12	3	1	0	43

Most teachers reported that it is likely or very likely that they will arrange a visit from a science centre to their schools, with funding to cover all the cost (93%). No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 94. Teachers' views on how likely it is that they would organise a visit from a science centre in future should external funding be available (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How likely is it that you would arrange a visit from a science centre to your school, with funding to cover all costs?	IMD	Lower IMD	50	No	0.914	80.885	0.364
		Higher IMD	43				
		Visited by a science centre	70	No	0.689	57.717	0.494
		Visiting a science centre	32				

Question 18: How likely is it that you would arrange a visit from a science centre to your school, without funding to cover all costs?

This question was answered by 120 teachers (70 visited by a centre, 32 visiting a centre, 18 other). From more deprived schools, 49 teachers answered the questionnaire, while 43 responses came from teachers in less deprived schools.

The next figure shows the overall distribution of the responses given for this question. This figure is followed by a table with the number of responses according to: 1) whether teachers 'visited a science centre' or were 'visited by a science centre', then 2) whether teachers work in schools with lower IMD (more deprived schools) or higher IMD (less deprived schools).

Figure 44. Teachers' views on how likely it is that they would arrange a visit from a science centre in future should external funding not be available (n=120)

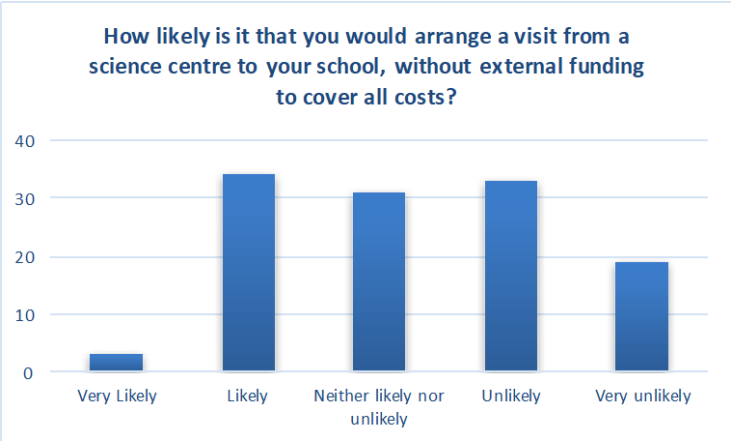

Table 95. Teachers' views on how likely it is that they would arrange a visit from a science centre in future should external funding not be available (n=120)

How likely is it that you would arrange a visit from a science centre to your school, without external funding to cover all costs?						
Groups	**Very Likely**	**Likely**	**Neither likely nor unlikely**	**Unlikely**	**Very unlikely**	**Total**
Visited by a science centre?	3	22	13	18	14	70
Visiting a science centre?	0	9	13	6	4	32
Other	0	3	5	9	1	18
Lower IMD	1	15	12	13	8	49
Higher IMD	1	14	11	13	4	43

Without external funding to cover all the cost, 43% of teachers reported that there it is unlikely or very unlikely that they would arrange a visit from a science centre to their schools, while 31% of them reported that they would do it. No statistical differences were found between teachers' responses when the comparison was done according to IMD or by whether they visited a centre or were visited by a centre. The following table shows the results for the statistical test for the different groups.

Table 96. Teachers' views on how likely it is that they would arrange a visit from a science centre in future should external funding not be available (n=120)

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How likely is it that you would arrange a visit from a science centre to your school, without external funding to cover all costs?	IMD	Lower IMD	49	No	-0.566	89.658	0.573
		Higher IMD	43				
		Visited by a science centre	70	No	-0.409	100	0.683
		Visiting a science centre	32				

Teacher CPD Questionnaire

A total of 84 teachers participated in Continuing Professional Development (CPD) activity evaluation from three science centres.

Table 97. Number of responses from bursary students by centre (n=969)

Teacher CPD questionnaire: Where do you work?			
Science Centre	A school or educational establishment in England, Wales or Ireland	A school or educational establishment in Scotland	Total responses
Glasgow Science Centre		22	22
National Space Centre	14		14
Science Oxford	48		48
Total	62	22	84

The analysis of this data focused on the differences between the responses of two groups of teachers: those who work in more deprived schools and those who work in less deprived schools. Thus, results of this questionnaire will be presented as follows: Each question will be presented with some descriptive statistics indicating the size of the sample and its main features, followed by a figure with the distribution of all responses, a table with detailed responses of the two groups of teachers, and the interpretation of the statistical test ran for the question. A summary of the statistical test ran for these groups can be found at the end of this section. It is important to notice that the statistical tests were not possible for the last two questions due to fact that the size of one of the groups was too small.

Question 6: How would you rate the activities overall?

This question was answered by 84 teachers (48 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

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Figure 45. Teachers' ratings of the activities overall (n=84)

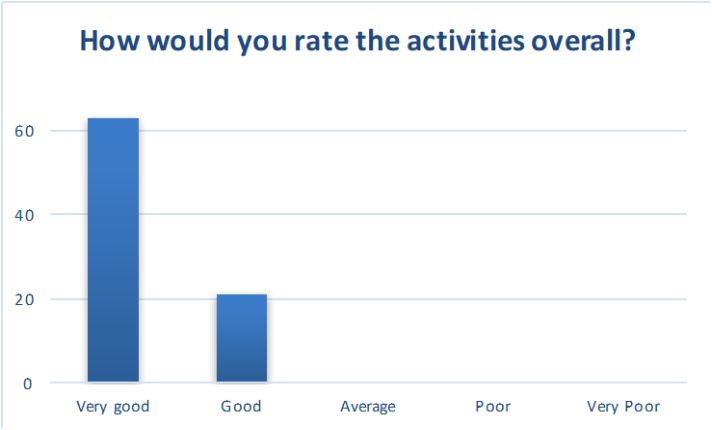

Table 98. Teachers' ratings of the activities overall (n=83)

How would you rate the activities overall?						
Groups	Very good	Good	Average	Poor	Very Poor	Total
Lower IMD	33	15	0	0	0	48
Higher IMD	29	6	0	0	0	35
Total	62	21	0	0	0	83

All teachers (100%) gave a positive evaluation of the activity. No significant differences were found between the responses of teachers who worked in less deprived schools with those who worked in more deprived schools.

Question 8: Was your expectation fully met through the event?

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 46. Teachers' ratings of whether their expectations were met (n=83)

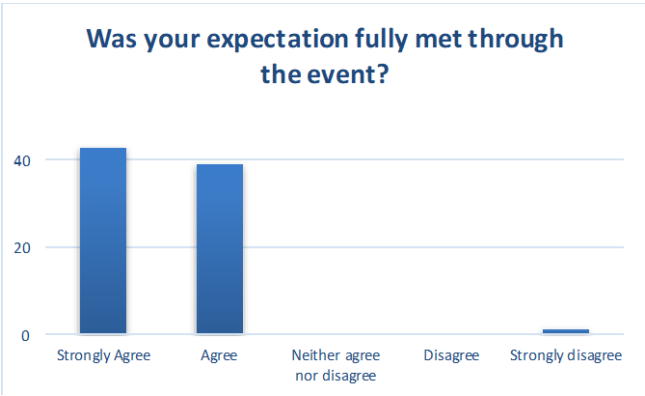

Table 99. Teachers' ratings of whether their expectations were met (n=82)

Was your expectation fully met through the event?						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	27	19	0	0	1	47
Higher IMD	15	20	0	0	0	35
Total	42	39	0	0	1	82

Most teachers (99%) reported that the activity met their expectations. No significant differences were found between the responses of teachers who worked in less deprived schools with those who worked in more deprived schools.

Question 10: How did the event make you feel?

a) 'I felt welcome'

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 47. Teachers' ratings of whether they felt welcome (n=83)

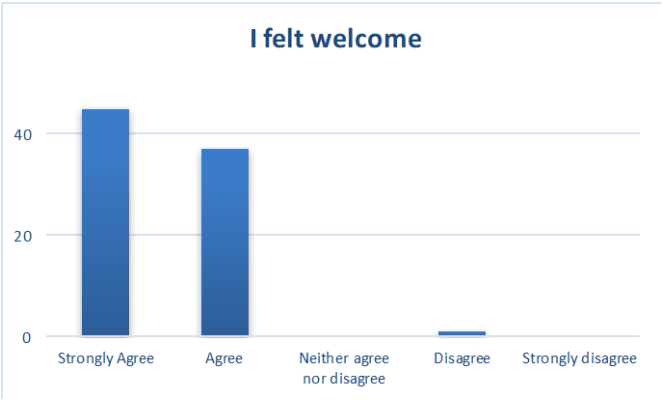

Table 100. Teachers' ratings of whether they felt welcome (n=82)

How did the event make you feel? I felt welcome						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	31	15	0	1	0	47
Higher IMD	13	22	0	0	0	35
Total	44	37	0	1	0	82

Most teachers (99%) felt welcomed in the activity. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools felt more

welcomed (strongly agreed = 66%) than those who worked in less deprived schools (strongly agreed = 37%).

b) 'I felt the day was useful to me as a teacher'

This question was answered by 84 teachers (48 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 48. Teachers' ratings of whether they felt the day was useful (n=84)

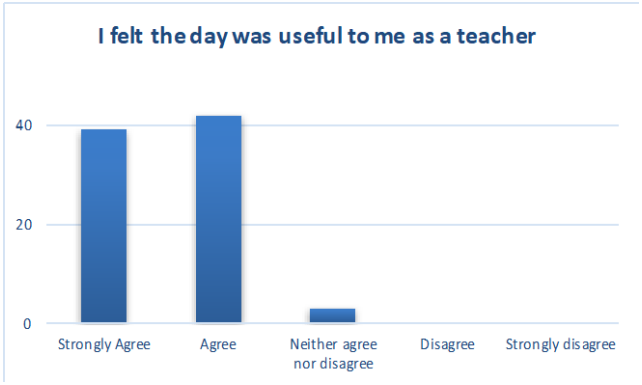

Table 101. Teachers' ratings of whether they felt the day was useful (n=83)

How did the event make you feel?	I felt the day was useful to me as a teacher					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	23	24	1	0	0	48
Higher IMD	15	18	2	0	0	35
Total	38	42	3	0	0	83

Most teachers (96%) reported that they felt that the day was useful for them as a teacher. No significant differences were found between the responses of teachers who worked in less deprived schools with those who worked in more deprived schools.

c) 'I now feel more confident in talking about this topic'

This question was answered by 84 teachers (48 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 49. Teachers' ratings of whether they felt confident in talking about the topics covered (n=84)

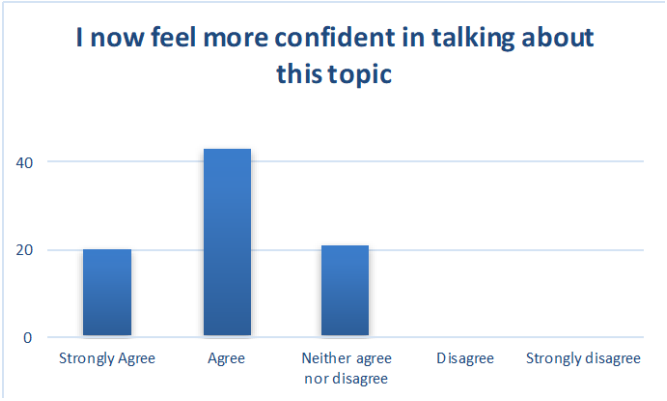

Table 102. Teachers' ratings of whether they felt confident in talking about the topics covered (n=83)

How did the event make you feel? I now feel more confident in talking about this topic						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	16	24	8	0	0	48
Higher IMD	3	19	13	0	0	35
Total	19	43	21	0	0	83

Most teachers (75%) felt more confident in talking about this topic than before the activity. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools felt more positive about this question (strongly agreed + agree = 83%) than those who worked in less deprived schools (strongly agreed + agree = 63%).

d) 'I felt inspired'

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 50. Teachers' ratings of whether they felt inspired by the event (n=83)

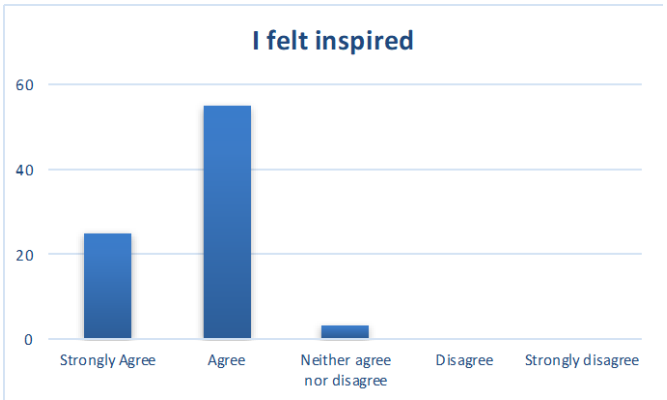

Table 103. Teachers' ratings of whether they felt inspired by the event (n=82)

How did the event make you feel? I felt inspired						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	20	25	2	0	0	47
Higher IMD	4	30	1	0	0	35
Total	24	55	3	0	0	82

Most teachers (96%) felt inspired after the activity. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools felt more positive about this aspect (strongly agreed = 43%) than those who worked in less deprived schools (strongly agreed = 11%).

e) 'I felt engaged'

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 51. Teachers' ratings of whether they felt engaged by the event (n=83)

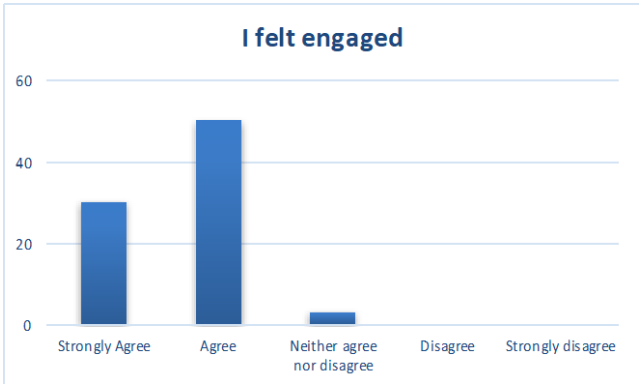

Table 104. Teachers' ratings of whether they felt engaged by the event (n=82)

How did the event make you feel? I felt engaged						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	23	21	3	0	0	47
Higher IMD	6	29	0	0	0	35
Total	29	50	3	0	0	82

Most teachers (96%) felt engaged in the activity. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools reported to have felt more engaged (strongly agreed = 49%) than those who worked in less deprived schools (strongly agreed = 17%).

f) 'I was able to join in and be part of the event'

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 52. Teachers' ratings of whether they felt able to join in with the activities (n=83)

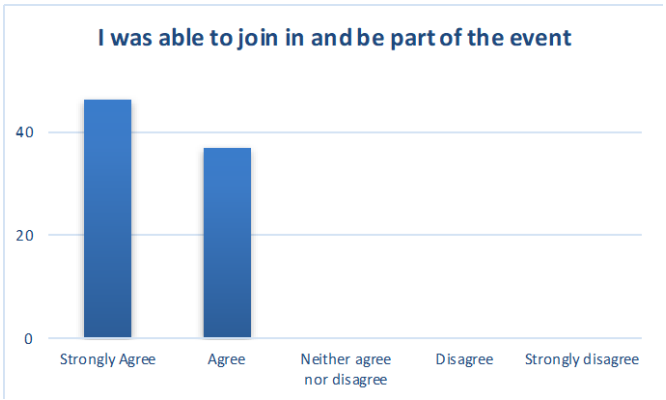

Table 105. Teachers' ratings of whether they felt able to join in with the activities (n=82)

How did the event make you feel?	I was able to join in and be part of the event					
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	24	23	0	0	0	47
Higher IMD	21	14	0	0	0	35
Total	45	37	0	0	0	82

All teachers (100%) felt that they could join in and be part of the activity. No significant differences were found between the responses of teachers who worked in less deprived schools with those who worked in more deprived schools.

Question 11: In terms of this event, what will you do next?

a) 'I will use things that they have learned on the activity in the classroom'

This question was answered by 83 teachers (47 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 53. Teachers' ratings of whether they would use what they had learned (n=83)

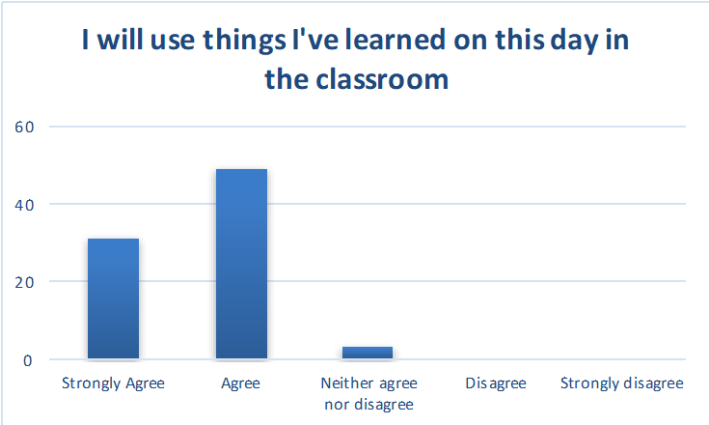

Table 106. Teachers' ratings of whether they would use what they had learned (n=82)

In terms of this event, what will you do next? I will use things I've learned on this day in the classroom						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	19	26	2	0	0	47
Higher IMD	11	23	1	0	0	35
Total	30	49	3	0	0	82

Most teachers (96%) reported that they will use things that they have learned during the activity in the classroom. No significant differences were found between the responses of teachers who worked in less deprived schools with those who worked in more deprived schools.

b) 'I will try to find out more about these topics'

This question was answered by 82 teachers (46 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 54. Teachers' ratings of whether they would research the topics covered (n=82)

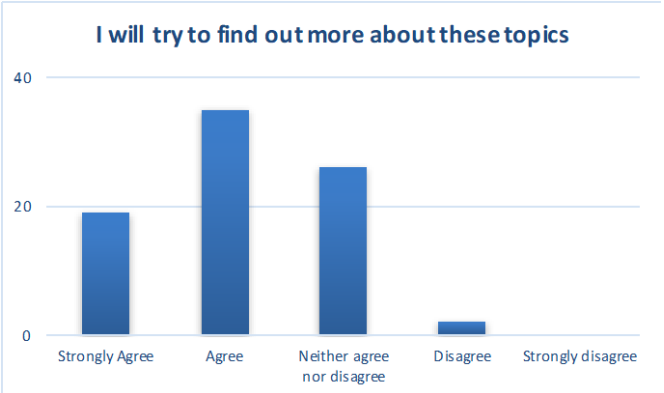

Table 107. Teachers' ratings of whether they would research the topics covered (n=81)

In terms of this event, what will you do next? I will try to find out more about these topics						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	16	26	4	0	0	46
Higher IMD	2	9	22	2	0	35
Total	18	35	26	2	0	81

Most teachers (66%) reported that they will try to find out more about these topics. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools reported being more positive about this question (strongly agreed = 35%, agree = 57%) than those who worked in less deprived schools (strongly agreed = 6%, agree = 26%).

c) 'I will share what I have learnt on this course with my colleagues'

This question was answered by 76 teachers (40 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 55. Teachers' ratings of whether they would share what they had learned (n=76)

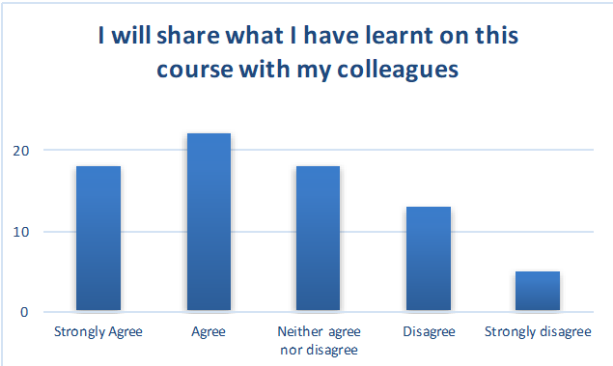

Table 108. Teachers' ratings of whether they would share what they had learned (n=75)

In terms of this event, what will you do next? I will share what I have learnt on this course with my colleagues						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Lower IMD	14	22	4	0	0	40
Higher IMD	3	0	14	13	5	35
Total	17	22	18	13	5	75

Most teachers (53%) reported that they will share what they have learnt on the course with their colleagues. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools reported being more willing to share what they have

learnt on the course (strongly agreed = 35%, agree =55%) than those who worked in less deprived schools (strongly agreed = 9%, agree = 0%).

d) 'I would be interested in attending another CPD event on this topic'

This question was answered by 80 teachers (44 from more deprived schools, 35 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 56. Teachers' ratings of whether they would be interested in further CPD (n=80)

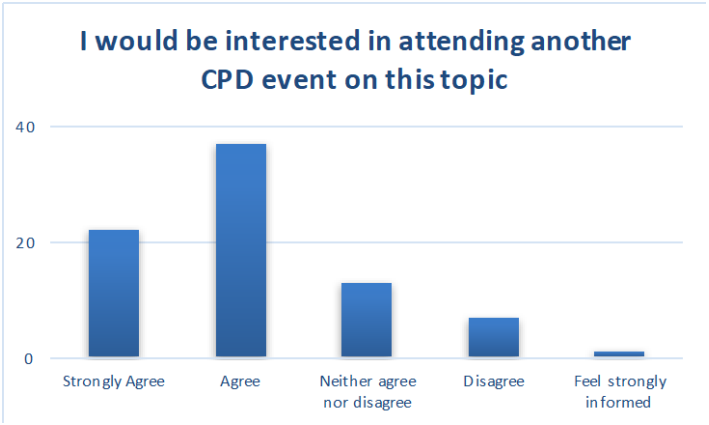

Table 109. Teachers' ratings of whether they would be interested in further CPD (n=79)

In terms of this event, what will you do next? I would be interested in attending another CPD event on this topic						
Groups	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Feel strongly informed	Total
Lower IMD	17	15	10	1	1	44
Higher IMD	4	22	3	6	0	35
Total	21	37	13	7	1	79

Most teachers (74%) would be interested in attending another CPD event on this topic. Statistical differences were found between the responses of the groups. Specifically, teachers who worked in more deprived schools were more positive about attending another CDP event on this topic (strongly agreed = 39%) than those who worked in less deprived schools (strongly agreed = 11%).

Question 12: Have you taken your students to a science centre in the last two years?

This question was answered by 46 teachers (42 from more deprived schools, 3 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 57. Had teachers taken students to a science centre in the previous two years? (n=46)

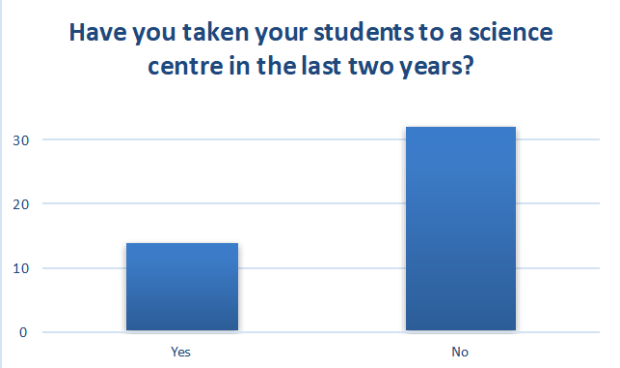

Table 110. Had teachers taken students to a science centre in the previous two years? (n=45)

Have you taken your students to a science centre in the last two years?			
Groups	Yes	No	Total
Lower IMD	14	28	42
Higher IMD	0	3	3
Total	14	31	45

Most teachers (70%) have not taken their students to a science centre in the last two years. Due to the sample size, no parametric test was run.

Question 13: How likely is it that you would now take your students to a science centre?

This question was answered by 50 teachers (46 from more deprived schools, 3 from less deprived schools, 1 from a school in the 3rd IMD quintile). The next figure shows the overall distribution of the responses for this question. This figure is followed by a table with the number of responses according to the IMD group.

Figure 58. Teachers' ratings of the likelihood of them taking students to a science centre (n=50)

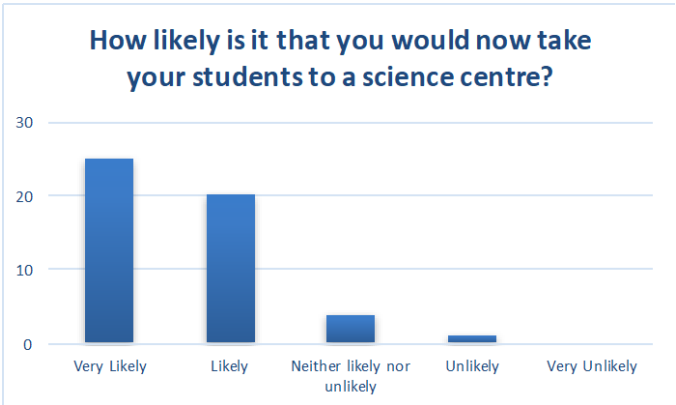

Table 111. Teachers' ratings of the likelihood of them taking students to a science centre (n=49)

How likely is it that you would now take your students to a science centre?						
Groups	Very Likely	Likely	Neither likely nor unlikely	Unlikely	Very Unlikely	Total
Lower IMD	22	19	4	1	0	46
Higher IMD	2	1	0	0	0	3
Total	24	20	4	1	0	49

Most teachers (90%) declared that it is likely or very likely that they would take their students to a science centre after this activity. Due to the sample size, no parametric test was run.

Summary of the t-tests

Table 112. T-tests for each item

Question	Category	Groups tested	sample size	Significant differences in the responses	T-test	df	Sig. (2-tailed)
How would you rate the activities overall?	IMD	Lower IMD	48	No	-1.461	81	0.148
		Higher IMD	35				
This expectation was fully met through the event	IMD	Lower IMD	47	No	0.609	79.727	0.545
		Higher IMD	35				
I felt welcome	IMD	Lower IMD	47	Yes	2.02	79.489	0.047
		Higher IMD	35				
I felt the day was useful to me as a teacher	IMD	Lower IMD	48	No	0.679	69.176	0.5
		Higher IMD	35				
I now feel more confident in talking about this topic	IMD	Lower IMD	48	Yes	3.115	77.563	0.003
		Higher IMD	35				
I felt inspired	IMD	Lower IMD	47	Yes	2.673	80	0.009
		Higher IMD	35				
I felt engaged	IMD	Lower IMD	47	Yes	2.148	80	0.035
		Higher IMD	35				
I was able to join in and be part of the event	IMD	Lower IMD	47	No	-0.8	74.052	0.427
		Higher IMD	35				
I will use things I've learned on this day in the classroom	IMD	Lower IMD	47	No	0.63	76.674	0.531
		Higher IMD	35				
I will try to find out more about these topics	IMD	Lower IMD	46	Yes	6.5	69.285	0
		Higher IMD	35				
I will share what I have learnt on this course with my colleagues	IMD	Lower IMD	40	Yes	8.865	73	0
		Higher IMD	35				
I would be interested in attending another CPD event on this topic	IMD	Lower IMD	43	Yes	2.153	71.037	0.035
		Higher IMD	35				
Have you taken your students to a science centre in the last two	IMD	Lower IMD	42	Insufficient sample size for the test			
		Higher IMD	3				
How likely is it that you would now take your students to a science	IMD	Lower IMD	46	Insufficient sample size for the test			
		Higher IMD	3				

Qualitative analysis of teacher evaluation forms

This section analysed the responses of the open-ended questions from the two teacher evaluation forms. The first form analysed is the School Event Teacher questionnaire. This questionnaire includes four independent open-ended questions, two follow-up multiple-choice questions (a 'why' question) and a final question in which they could comment about whatever they want. The second form analysed is the Teacher CPD questionnaire. This questionnaire includes six open-ended questions and a last general comments question.

This analysis focuses on the recognition of patterns across the data set that are important for understanding the answers of the question in relation to the programme.

The analysis will be presented as follows: for each questionnaire, each question will include a description of the respondent group. Then, a description of the themes that emerged from the thematic analysis offered along with some representative examples of those themes.

Qualitative analysis of the School Event Teacher questionnaire

This questionnaire was responded by 129 teachers (76 visited by a centre, 34 visiting a centre, 19 other[5]). Four independent open-ended questions and two follow-up questions were analysed, additionally, teachers have the opportunity to give any comments that they consider important, a summary of these comments is offered.

Question 7: What did you particularly like about today's activities?

This question was answered by 122 teachers (72 visited by a centre, 31 visiting a centre, 19 other). Of the total, 55 teachers worked in more deprived schools and 42 in less deprived schools.

Three themes emerged within the responses of this question: 1) engaging and interaction; the activities have a good pace and were hands on, which were the main aspects commented by teachers; 2) Good explanations; and 3) Equipment. Like the students, many teachers valued the opportunities to interact with equipment that is not usually available in schools. All these three themes are present across all teachers (those that were visited by a centre, visiting a centre, other and for those who worked in more deprived and less deprived schools).

Examples:

1) Engaging and interactive
   - 'Fun and interactive'
   - 'Engaging, fast paced, kept students interested'
2) Good explanations
   - 'A very interactive programme which was pitched at the correct level for pupils'
   - 'Engaging experiments for class and experts on hand to explain science behind each stall
   - 'Clear explanations, activities that the pupils had not encountered before, the ability of the presenter to communicate complex ideas well to a young year group'
3) Equipment
   - 'Van de Graff generator'
   - 'Using equipment that is not widely available at school'
   - 'Thermal imaging camera'

Other aspects not that common but important nonetheless, are that the programme seemed to allow teachers to connect with some specific topics within their classroom, for example, 'Enjoyed being able

[5] The category of 'Other' represents those teachers who answered 'neither of the above' (visited a centre nor visiting a centre) or those who left this question with no answer

to explore many areas with the pupils. The Explore Your Universe has enabled me to be able to teach the topic of the electromagnetic spectrum in more detail in class'.

Question 8: Which aspect(s) of these activities are you not able to deliver in school, and why?

This question was answered by 102 teachers (60 visited by a centre, 26 visiting a centre, 16 other). Of the total, 46 worked in more deprived schools and 35 in less deprived schools.

The main theme that emerged in this question was the lack of equipment. They also mentioned the lack of knowledge: 'My own subject knowledge is not good enough (my responsibility, obviously) and I don't have the equipment. My science seminars during teacher training were very poor' or 'Presentation - due to staff expertise and knowledge'. Another topic raised by some teachers is the time constraints: 'We have the potential to deliver some of these activities but no time to deviate from core curriculum content' or 'A lot of it is due to a lack of resources and time to cover these topics in depth'. Overall, teacher responses were similar for all (those that were visited by a centre, visiting a centre, other and for those who worked in more deprived and less deprived schools).

Examples:

1) Lack of equipment
   - 'Infrared camera - don't have the resources.'
   - 'All because of equipment.'
   - 'We don't have the equipment to help explain tricky concepts.'

Question 9: What, if any, effect might such activities have had on your students' long-term motivation for science?

This question was answered by 92 teachers (56 visited by a centre, 24 visiting a centre, 12 other). Of the total, 38 worked in more deprived schools and 35 in less deprived schools.

Two main themes emerged from teachers' responses to this question. The first is related with the understanding of science in a new way, in this respect teachers think that these activities encourage students to think of science as an interesting subject. The second theme that emerges is related with the opening up of the possibilities that they might have within STEM. There were not clear differences between the themes raised by the different groups of teachers.

Examples:

1) Science in a new light
   - 'A lot of the exhibits in W5 really stimulated the students interest and made them think about science in a whole new way. I really think some of them are truly inspired to to either pursue science in the future as a career option or at least have developed some respect for it.'
   - 'Inspire and motivate the pupils to engage with science'

- ‘Create a 'WoW' for Science’
- ‘It has made them curious to explore our science topic further, they were more excited about learning and science.’
- ‘Curiosity. Use of everyday uses for the activities’

2) New possibilities
   - ‘Raising aspirations and inspiring learners into alternative careers. The careers that are accessible to our pupils’
   - ‘Broadens students horizons about potential for STEM careers.’
   - ‘Realisation of vast opportunities in science’

Question 10b: Will you talk about Explore Your Universe content with the students in the future? If yes, how?

This is a follow-up question to ‘Will you talk about Explore Your Universe content with the students in the future?’. Here are analysed the positive answers to that question. Thus, the number of teachers that answered ‘yes’ to that question were 91 (57 visited by a centre, 24 visiting a centre, 10 other). From these teachers, 77 (46 visited by a centre, 22 visiting a centre, 9 other) responded to the follow-up question. 32 of them worked in more deprived schools and 31 in less deprived schools.

When teachers responded to the question ‘how will they talk about EYU content with the students in the future, most of them referred to specific topics within the curriculum: 1) Within specific topics; teachers mentioned specific topics in which they can relate the content and experiences. Overall, the ways in which teachers can relate with these activities seems to be quite direct. There were a couple of comments that focus on the methodology underpinning these activities, such as, ‘Enquiry based learning’ or ‘Answering questions bought up by the presentation together’, however these comments were not developed enough to understand what and why they refer to this.

Examples

1) Specific topics
   - Topics - experiments / writing
   - Light / space topics within school.
   - Whenever topics like space, electrons, wavelengths come up (discussed in workshop)
   - Doing the space topic, spend more time exploring wider universe.

Question 12b: Will you recommend these activities to other teachers? Please give reasons for your above answer?

This is a follow-up question to ‘Will you recommend these activities to other teachers?’. This question was answered by 120 teachers, of which 98% would recommend these activities to other teachers. The follow-up question was responded to by 73 (42 visited by a centre, 21 visiting a centre, 10 other). 33 of them worked in more deprived schools and 25 in less deprived schools.

Teachers who would recommend these activities to other colleagues alluded to two main aspects: 1) motivation of learners; many teachers explained that these activities fostered positive emotions towards learning science, motivation and engagement being the most common; 2) use of resources, teachers explained that these activities include resources that they might not be able to provide to students. Only one of the teachers who would not recommend these activities to other teachers explained their reason: 'Activities pitched too high for age of children - vocabulary too advanced'.

Examples for 'Yes':

1) Positive emotions towards science learning
   - As it motivated learners.
   - All chn engaged + talk about it.
   - Very clear presentation valued each childs response
   - Interesting, inspiring and excellent idea to engage P7 pupils.
2) Use of resources
   - Although we have not got some of the equipment the ideas may be taken and used in a different way.
   - Learning about electric fields/magnet fields and atoms is tricky - good visual aids today.
   - It delivers something you might not be able to. It benefits the pupils.
   - clear and concise activities that pupils find interesting and allowing them to access GCSE topics

Question 14: How would you describe STFC research to a colleague?

This question was answered by 50 teachers (30 visited by a centre, 13 visiting a centre, 7 other). 19 of the respondents worked in more deprived schools and 18 in less deprived schools.

Two types of responses were received for this question. One that focuses on the type of organisation that STFC seems to be (company, agency, community) and the other focuses on the characteristic of the activities that teachers attended.

Examples:

1) Type of organisation
   - STFC is a multi-disciplinary agency promoting science with an identifiable benefit to us.
   - A company which investigates the universe?
   - Researching advances in science.
   - A science community in Europe, helping to create a telescope.
   - A community promoting science
   - Gov. funded
   - An organisation that provides funding to projects and want to encourage young children/adults to follow careers in physics.
2) Characteristics
   - Inspiring

- Interactive and educational
- Engaging + knowledgeable.
- A fun, hands on experience
- Dynamic and engaging.
- Inspiring
- Cutting edge and very interesting

Overall, the low number of responses for this question suggest that teachers are 'unsure' of what is STFC.

Question 19 Do you have any other comments or suggestions that you'd like to share with us?

This last question was answered by 45 teachers. Most comments were positive, comments such as 'Thank you for providing the workshop in Welsh. The children enjoyed the company of Connor and Rhodri, and the terminology and concepts were explained well'. Some problems with the venue were identified. For example, Cambridge Science Centre indicated that the venue is too noisy 'Venue - too noisy, hard to hear delivery of content'.

Some suggestions include:

- 'More explanation of what can learn from the activities'.
- 'Better time management - a lot of time spent filling in form.'
- 'It would be great to perhaps have a longer workshop just because of how good it was with the time we've had.'
- 'More stations which would lead to fewer in groups and less time on each station.'

Economical aspects were also pointed out by teachers:

- 'We have to cover staff costs too and it becomes far too expensive... School has no money!'
- 'We did this because it was free! We enjoyed it because it was first rate. Without the free aspect the children would have lost out.'

Qualitative analysis of the Teacher CPD questionnaire

This questionnaire was responded by 84 teachers from three centres. This questionnaire includes three open-ended question related with expectations and two follow-up questions regarding how they felt and what to do next. Lastly, teachers have the opportunity to give any comment that they consider important, a summary of these comments is offered.

Question 7: What were you expecting to get out of this event?

This question was answered by 78 teachers. From the teacher responses three main themes can be recognised; 1) ideas; most teachers expected to receive/see good ideas for taking into the class 2)

practical activities, as a way to engage pupils, and 3) knowledge, both pedagogical content knowledge and scientific content knowledge.

Examples:

1) Ideas
   - 'Bright ideas'
   - 'Ideas to help promote pupil led investigation'
   - 'Discussion of ideas'
   - 'Ideas for science investigations'
   - 'Ideas for teaching science'
2) Practicals
   - 'Practical application and experiences'
   - 'Activities to take back to the classroom'
   - 'Activities catering to a KS1 level ideas'
   - 'Practical ideas to use as lesson starters'
3) Knowledge
   - 'Subject knowledge'
   - 'Learner engagement and enjoyment. Ideas for active learning in our classroom'
   - 'Ideas to get children talking'
   - 'Learn how to teach science/space/physics'
   - 'More creative approach to teaching science'
   - 'Interactive ideas to use in the primary school'
   - 'Develop scientific knowledge – exploration'

Question 8b: Was this expectation fully met through the event? Please explain your answer:

This is a follow-up question to 'Was this expectation fully met through the event?'. Responses in this original question were positive (99% reported their expectations were met through the event). Thus, 39 teachers responded to the follow-up question.

In a previous question, teachers were asked about their expectation of the activities. Three main themes emerged (ideas, practicals, knowledge). The answer within this question addressed these aspects. Thus, in relation with all three themes teachers reported that they received what they expected. But also, within these responses another theme rises, 4) because of their students; some teachers indicated that the activity was fulfilled because they saw their pupils engaged and enthusiastic about science.

Examples:

1) Ideas
   - 'I now have more of an idea how to do it'
   - 'Lots of good stimuli and places to go for resources'
   - 'Great ideas for teaching styles and very enjoyable. Great to have a focus on science'

2) Practicals
   - 'The activities were very practical and engaging and there were lots of opportunities to ask questions'
   - 'Lots of activities, like the fact session was slightly adapted to fit more chemistry'
3) Knowledge
   - 'He was very knowledgeable and passionate and explained things well'
   - 'Learnt so much more than I expected'
4) Because their students
   - 'All our learners enthusiastic about today'
   - 'Even though some children feel they know loads about space they were aware of how much they have to learn'

Question 9 and 9b: What did you get from today's event that you weren't expecting?

This question was answered by 27 teachers. The themes can be identified within these responses. 1) useful ideas; even though many teachers were expecting new ideas, these answers suggested that the ideas they received were more 'hands on' than what they expected, 2) for teachers; responses suggested that teachers feel that the activities were developed having their needs taken into account, and equipment.

1) Useful ideas
   - 'Affordable realistic activities'
   - 'Quick 'talk' activities'
   - 'Lots of quick, easy activities to use'
2) For teachers
   - 'Contact details and offers of help'
   - 'Practical teaching advice'
   - 'Opportunities to practice'
   - 'Participation as a class and having time to think as a teacher'
   - 'The staff were very helpful in 'rounding up' our pupils'
   - 'Was adapted to our needs and full explanation of a range of topics - hugely applicable and fun'
3) Equipment
   - 'Resources for school e.g. plasma ball'
   - 'Different stalls to make glasses etc'
   - 'Lots of ideas, Free science supplies for school'
   - 'Physical resources to take away like a plasma globe. These resources will be great to use in class.'
   - 'Goody bag of materials and great ideas for exciting experiments'

Question 10b: How did the event make you feel? Comments:

This is a follow-up question of the multiple choice question 'How did the event make you feel? (a. I feel welcome, b. I felt the day was useful to me as a teacher, c. I now feel more confident in talking

about this topic, d. I felt inspired, e. I felt engaged, f. I was able to join in and be part of the event)'. Nine comments were received within this section. Seven of them were very positive, such as, 'Absolutely fantastic, best CPD. Sophie was amazing and adapting to our queries and needs', and 'what a fantastic session! Reintegrated my love for science and I'm so excited to teach my science module this year, which i was dreading before'. One comment was negative 'Staff made us feel awkward and under pressure at times not entirely and warm to pupils' and other was a suggestion 'Evaluation needed at some later point in the year to measure impact'.

Question 11b: In terms of this event, what will you do next? Comments:

This is a follow-up question of the multiple choice question 'In terms of this event, what will you do next? (a. I will use things I've learned on this day in the classroom, b. I will try to find out more about these topics, c. I will share what I have learnt on this course with my colleagues, d. I would be interested in attending another CPD event on this topic)'. 14 comments were received within this section. Many of them were related with the fact that all their colleagues were present that day, and therefore they could not 'share' the activities with them. Others were positive comments saying how much they enjoyed the activities. And one indicates that 'No more CPD. I have enough to do'.

Question 15: Do you have any other comments or suggestions that you'd like to share with us?

Comments were left by 32 teachers. Most of them praised the methodology used, such as, 'Lots of fantastic ideas to take away and implement in our own teaching' or 'Very enjoyable. It is not often we get to participate as the children would and begin to think about things from their perspective'. Others were suggestions, for example, 'Could have been split up at lunch time as on previous visits as 'Clyde suite' very noisy' or 'I feel it would be useful in the main auditorium to have more staff on hand to interact with and engage the children in the learning aspect of the exhibits' and 'Large group who teach over a range of ages. Would be good if more key stage specific'.

Appendix 3: Evaluation Forms