Evaluation of the impact of the Cohort 3 ENTHUSE Clusters

Final Report

November 2014
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Executive Summary

In August 2014, Myscience commissioned the Office for Public Management to evaluate the impact of the ENTHUSE Cluster Award Programme on the third cohort of schools. Our methods comprised: interviews with 12 cluster leads; case study research in two schools; analysis of reports submitted by cluster leads as part of routine programme monitoring; and analysis of three waves of teacher survey data collected by Myscience. The evaluation was carried out between August 2014 and October 2014 and this report sets out our findings.

Programme Impact

**Teachers**

Our interviews with cluster leads identified the following impacts for teachers:

— Increased confidence in using different or more creative approaches to teaching such as enquiry based learning, outdoor learning and/or more practical activities.

— Greater access to new teaching resources and external support including from the other schools in their cluster, the National Science Learning Centre, local science partnerships, and local industry.

— Increased willingness to try out new approaches to teaching science which are ‘outside their comfort zone’.

— Improved understanding of how STEM subjects are taught across different tiers of schools, where this was a focus for the cluster.

— Increased appetite for subject-specific CPD and greater awareness of the range of training and development opportunities available to them.

In the final wave of the programme survey, over 90% of teaching staff agreed with statements that their knowledge, skills and confidence to teach science had improved, and over 85% felt that participation in the programme had meant that their colleagues had also benefitted.

**Schools**

We found varied impacts across schools, reflecting the different aims of the clusters. They include:

— Increased profile of STEM subjects in schools, as evidenced by the application of STEM learning/approaches to other subject areas (such as enquiry based learning in geography and history), and an increase in STEM days/weeks in some schools.
— New or improved links with higher education and industry creating opportunities for ‘real world’ learning for pupils and increasing schools' knowledge of local STEM career opportunities.

— Better understanding of how science is taught at key stage 2 and key stage 3 and alignment of approaches and expectations of pupils across different tiers of schools.

— Access to a sustainable network of science leads to share ideas and resources and collectively address common challenges. In some cases, the programme has been a catalyst for wider collaborative activity such as seeking the Primary Science Quality Mark award.

In the final wave of the programme survey, 88% of teaching staff agreed that leaders at their school are more likely to support subject-specific CPD as a result of their involvement in the ENTHUSE cluster programme.

Pupils

Across the programme there was anecdotal evidence of:

— Improved enjoyment and engagement in science as a result of more engaging forms of teaching. In at least two clusters, schools are consulting with students to shape the way that science is taught.

— Access to wider STEM learning opportunities through links with industry and higher education institutions. This has led to a greater awareness of STEM careers and opportunities.

— Improved thinking skills through greater use of enquiry based learning, evidenced in some schools through practical assignments and presentations.

— Smoother transitions from primary to middle or secondary school as a result of shared science days and shared resources, as well as better transition planning by teaching staff.

Whilst many cluster leads felt unable to comment on the programme’s impact on attainment (due to lack of hard evidence, acknowledgement of the difficulties isolating the impact of ENTHUSE from other activities, or a belief that it is too early to say), 82% of teachers in the final wave of the survey agreed with the statement that participation in the ENTHUSE programme has helped increase pupil attainment in science.

Conclusions and recommendations

All of the evidence points to a well-run and well-received programme. The programme has been successful in its aim of supporting school-to-school CPD, whilst encouraging clusters to engage with the National Science Learning Centre and regional centres. It has increased teachers’ awareness of the range of CPD support available to them, and some plan to
access additional subject-specific CPD through the national and regional centres following the end of the programme. There is encouraging evidence that the majority of the partnerships which have been developed or enhanced through the programme will be sustained in the absence of ENTHUSE funding. Indeed, several clusters intend to widen their partnership to include other schools in their locality.

As would be expected, the type and scale of impacts varies across clusters and is related to their intended outcomes as well as schools’ level of participation in the programme. Clusters which appeared to have the greatest success were those which were characterised by some or all of the following:

— an experienced cluster lead organisation/school, who ensured that cluster activity was underpinned by effective planning and logistics

— strong senior-level support from schools, which was central to teaching staff being released to participate in CPD and, importantly, put their learning into practice and access further CPD

— enthusiastic teachers who would champion the programme in their school and share their learning with others

— alignment with other activities aimed at improving teaching and learning in science such as the primary science quality mark.

A small number of issues came up which Myscience may wish to consider in the design of future programmes.

1. Extending the programme, or at least the final reporting deadline, beyond 12 months. Having a slightly longer programme timeline would allow for more upfront planning, and would give cluster leads the opportunity to evidence all activities and impacts in their final reports.

2. Creating opportunities for clusters to find out about what others are doing, either through a face-to-face event or simply by sharing a written overview with them.

3. Facilitating a ‘celebration event’ at the end of the programme which brings clusters together to showcase their work, celebrate success and highlight how they intend to sustain the programme.
1. Introduction

In August 2014, Myscience commissioned the Office for Public Management (OPM) to evaluate the impact of the ENTHUSE Cluster programme with the third cohort of schools. The aim of ENTHUSE Cluster Awards is to enable groups of schools to work collaboratively to improve teaching and learning in science. Specifically, it seeks to:

— Enable groups of schools to work collaboratively in sustainable partnerships on improving teaching and learning in science
— Increase reach by engaging schools which previously have not engaged with the National Science Learning Network (NSLN)
— Support the move to school to school CPD while encouraging clusters to engage with local science learning centres and partnerships.

Cohort 3 of the programme consisted of 16 clusters located across England, which each received a maximum of £8k to fund their activities.

The Evaluation

The purpose of the evaluation is to provide evidence of impact on teacher development, pupil outcomes and schools’ willingness to engage in subject-specific CPD. Its specific objectives are to:

— Assess the impact on pupils, teachers and schools
— Assess the extent to which the programme has met its aims
— Draw out any differences of impact relating to different structures of clusters.

In brief, our methods comprised:

— A review of the monitoring and evaluation reports submitted to Myscience by ENTHUSE cluster leads
— Analysis of three waves of survey data collected by Myscience from participating schools
— Semi-structured, telephone interviews with 12 cluster leads. All 14 cluster leads were invited to participate, however two chose not to or were unable to.
— Case study research in two schools.

The evaluation was carried out between August 2014 and October 2014.
This Report

This report presents our findings and conclusions from the evaluation. It begins with a brief overview of programme implementation, with the remainder of the report setting out our findings under the following headings:

Chapter 3: Programme Impact

Chapter 4: Facilitators and barriers

Chapter 5: Sustainability

Chapter 6: Conclusions and Recommendations

Appendix 1 sets out a detailed analysis of the survey data.
2. Programme implementation

This chapter provides a brief overview of programme implementation and is intended as a backdrop to the findings presented in subsequent chapters.

Locally defined outcomes

Each cluster specified a small set of outcomes they hoped to achieve through their participation in the ENTHUSE programme. There was some overlap between the intended outcomes of different clusters, with most aiming to achieve one or several of the following:

— Develop teacher confidence and skills to deliver the new curriculum
— Develop enquiry skills in students
— Improve leadership in science teaching
— Increase the breadth of teaching and learning opportunities
— Developing a common approach to Assessment for Learning (AfL)
— Build relationships between primary, middle and secondary schools
— Promote the use of outdoor science learning
— Improve links between schools and science based business/industry.

Several clusters undertook an initial consultation exercise with schools to identify teachers’ priority areas for learning and development. Cluster leads commonly observed that some staff lacked confidence in teaching science, particularly in relation to enquiry based learning:

“We found that there is a weak understanding of what enquiry is and we wanted to increase the breadth of curriculum because it’s often not linked to real life problems.” (Cluster lead)

The intended outcomes and activities of clusters were also influenced by external developments in STEM teaching and learning including: the removal of science from SATS assessment; reforms of the national curriculum; and a national drive to improve access to STEM careers.

Cluster structures

Different approaches were taken to cluster formation. In some areas, cluster leads utilised pre-existing relationships and networks between schools, while in others they approached schools individually in order to form a new partnership.
There were variable numbers of schools participating in each cluster, including two ‘double clusters’ where there were high numbers of participating schools. Some clusters combined ENTHUSE funding with other funding streams and/or related projects in order to maximise impact, for example the Primary Science Quality Mark (PSQM) award programme. Three cluster leads talked about schools in their cluster either already working towards the PSQM, or now doing so as a result of the ENTHUSE programme.

**CPD activities**

Clusters undertook different types of CPD, which reflected their different intended outcomes as well as what was most feasible and practical for their schools. Some clusters accessed full days of CPD through their regional Science Learning Centre or the National Science Learning Centre. Others commissioned CPD sessions to be delivered locally, or undertook a combination of the two. Other examples of CPD identified by cluster leads were:

- Collectively sharing lesson plans, good practice and Ofsted recommendations across the partnership
- Peer-to-peer coaching across the cluster
- Implementing science-related projects that put learning in to practice, and reporting back successes, learning and challenges to the cluster.

Cluster leads also identified a range of activities that were undertaken to support their overall aims including: attending science-related events and visits to places of science and technology industry; visits to science departments at Higher Education institutions; training for STEM ambassadors; and workshops to undertake collective monitoring and assessment.

**Contact with the National Science Learning Centre and regional and local support**

Cluster leads and teachers had a varying degree of knowledge of, and contact with, the NSLC prior to the ENTHUSE programme. In the first wave of the programme survey, over half of teachers reported being unfamiliar with the NSLC. The programme has opened up the opportunity for schools to learn about and have contact with the NSLC, some of whom have taken this up.

“At all stages [of the project], participants have been encouraged to pursue CPD through the SLP and the NSLC.” (Cluster lead)

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1 In one cluster, four schools had already achieved the PSQM and three were subsequently working towards it. In another cluster, all the schools were working towards the PSQM as a cluster group, and in the third cluster, the schools were working towards it as part of a larger group of 29 schools.
“We had excellent input via the SLC. One of the teachers has since attended training at the NSLC and shared ideas from it with the rest of the school.” (Cluster lead)

Many cluster leads spoke in very positive terms about the information, support and CPD they received from their regional SLC and the NSLC, which in some cases has helped shaped their project.

“The sessions at the SLC were a great inspiration and led to the project following a certain developmental route in relation to the new curriculum.” (Cluster lead)

**Uptake and engagement**

Uptake and engagement with the programme was variable, both between and within the clusters. Some cluster leads reported strong engagement and commitment across all of their schools. More commonly, cluster leads experienced variable engagement across schools in their cluster, including schools where engagement ‘tapered off’ towards the end of the programme.
3. Programme impact

This chapter describes the impact of the ENTHUSE at the programme level. The case studies in Appendix 2 offer a detailed look at the impact on two individual schools.

Impact on teachers

Cluster leads were overwhelmingly positive about the impacts of the programme for teachers. As the direct beneficiaries of the CPD and other activities, impacts for teachers were often the most easily identifiable. In the final wave of the programme survey, over 90% of teachers who responded agreed that the CPD they received had increased their skills, knowledge and confidence to teach science (Figure 1).

Figure 1: Respondents’ agreement with statements about the impact of the programme on their skills, knowledge and confidence

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>The CPD increased my skills to teach science</td>
<td>56%</td>
<td>35%</td>
<td>9%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>The CPD increased my knowledge to teach science</td>
<td>59%</td>
<td>35%</td>
<td>3%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>The CPD increased my confidence to teach science</td>
<td>59%</td>
<td>32%</td>
<td>3%</td>
<td>3%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Base: 34

Interviews with cluster leads provided additional evidence of these impacts and revealed a range of other impacts. Our findings are set out in the following sections.

Increased confidence

For most clusters, increasing teachers’ confidence in teaching science was a key aim. Where teachers had fully engaged with the programme, cluster leads reported that their skills and knowledge had increased across one of more of the following areas:

- Enquiry based learning
- Teaching the new science curriculum
- Delivering outdoor learning
- Assessment and monitoring
- Knowledge of STEM career opportunities
Applying practical examples from industry and the ‘real world’.

This was evidenced by cluster leads’ observations, teachers’ self-reports, and examples of lesson planning. It was also made evident by the way some teachers had adapted their practice following involvement in the programme.

Across clusters, teachers have experimented with more creative and varied approaches to teaching the curriculum. One cluster lead reported that teachers have been more willing to take risks with their teaching and to share their successes and failures with others. Another spoke of teachers trying out approaches that are ‘outside their comfort zone’.

Cluster leads reported that some teachers are moving away from rigid ‘worksheet’ formats and increasing the number of practical activities undertaken. For example, some teachers are using outdoor spaces much more in their teaching.

### Increasing teachers’ confidence in delivering outdoor learning

In one cluster, the schools were all located within a short walking distance of a local communal open space. Some teachers were lacking in confidence to deliver outdoor science learning to their pupils, having no previous ‘hands on’ experience of doing so.

Through the ENTHUSE programme, teachers undertook a course of CPD and practical activities, which opened their eyes to the possibilities and benefits of outdoor learning. It broke down previously held assumptions that taking pupils outdoors was daunting or burdensome, and proved to be an effective and engaging way for pupils to learn.

By the end of the course, teachers from three schools had independently planned and delivered lessons to groups of pupils on the common.

### Supporting transitions

Improving the transition between different tiers of schools (primary, middle and/or secondary schools) was the key focus for several clusters. Teachers in different tiers of schools are often isolated from one another, and can have different expectations of pupils and approaches to assessment.

These clusters provided teaching staff with opportunities for collaborative working which has built positive relationships across the key transition stages (for example, by having key named contacts in each school). For secondary and middle school teachers, this has given them a greater understanding of the level of skill that pupils have acquired in primary school and enabled them to plan accordingly. At the same time, primary school teachers have gained a better understanding of the key skills required at middle or secondary level and are therefore better placed to prepare their students for transition. Primary teachers have also
benefitted from having access to the resources and expertise of secondary subject specialists to support their lesson planning.

**Access to resources/external support**

Through the programme, teaching staff have accessed a wide range of external expertise and resources to support them in their teaching. These wider networks have enabled teachers to deliver a more enriched science curriculum:

“Until [the teachers] went to Sizewell B they wouldn't have known how a nuclear power station operates, [they learnt through] touring with the physicists”. (Cluster lead)

Cluster leads reported that teachers are now more aware of the resources on offer to them through the National Science Learning Centre. Furthermore, teachers have continued to access resources and expertise from the links made with other teaching staff, industry and university partners:

“There's a lot more engagement of external support; teachers have invited individuals from business and industry to demonstrate and articulate the subject area they have been teaching.” (Cluster lead)

**Increased appetite/awareness of CPD**

Teachers’ prior awareness of and engagement with CPD was variable both within and between clusters. While some teachers had undertaken extensive CPD (for example through their work towards the PSQM award), many others had not accessed any subject-specific CPD previously. Cluster leads attributed this to a lack of awareness of what was available and of the financial support that might be available.

“There was a real lack of awareness of what training was available to them [teachers] that was free.” (Cluster lead)

Cluster leads were confident that as a result of participating in the programme teaching staff are now more aware of the range of training and development opportunities available to them.

Following the programme, teachers across clusters have displayed a real appetite and drive for ongoing skills development. We found numerous examples of teachers who have since committed to further courses from the National Science Learning Centre or local science centres.
Increased appetite for learning and development

In one cluster, a science lead has signed up to an accredited course at the National Science Learning Centre as a result of her involvement in the programme. The course takes place over a two year period, demonstrating her real commitment to applying best practice as a subject leader. Furthermore, she has fed back programme information to colleagues, helping to increase awareness of CPD opportunities throughout her school and cluster.

Cluster leads have acted as real advocates for CPD and actively encouraged teachers to take advantage of the wide range of courses on offer.

Impact on schools

In the third programme survey, respondents were asked how much they agreed with three statements about the impact of the ENTHUSE cluster programme on the way that teaching is delivered in their school (Figure 2).

Figure 2: Respondents’ agreement with statements concerning the impact of ENTHUSE on schools

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase interdisciplinary learning approaches where science can be incorporated into a range of common topics</td>
<td>38%</td>
<td>50%</td>
<td>3%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to provide more varied approaches to science learning and teaching</td>
<td>44%</td>
<td>50%</td>
<td>3%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase science activities in the curriculum</td>
<td>38%</td>
<td>59%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Base = 34

Figure 2 reveals that the vast majority of teachers believe that the ENTHUSE programme had impacted positively on science teaching, by increasing interdisciplinary learning approaches, making teaching more varied and by increasing science activities in the curriculum.

Our interviews with cluster leads support these findings, and reveal some additional positive impacts of the programme, reported in the following sections.
New approaches to teaching science

Cluster leads reported that as a result of the programme schools are teaching science in new and varied ways. In particular, where subject leads have disseminated learning to their colleagues, there has been a demonstrable impact on practice across the school:

Creating and implementing ‘Principles of Science’

As part of their work towards the PSQM award, supported by the ENTHUSE programme, one school undertook an activity where staff came together to collectively identify and agree a set of ‘principles of science’ that will underpin the work in their school. They produced an action plan for putting these principles into practice across the school, including key milestones and evidence of implementation through their lesson planning.

Schools have been shown to use more creative and varied approaches in science lessons, moving away from worksheet based approaches and increasing the use of enquiry based learning. This has included the greater use of outdoor spaces for science teaching. In at least one cluster, schools have improved their outdoor areas in direct response to pupil feedback about wanting to have more outdoor learning opportunities.

Increased focus on STEM subjects

Raising the profile of STEM subjects within the schools was frequently highlighted by cluster leads as an important outcome of the programme. This is evidenced by the application of STEM learning/approaches to other subject areas, such as enquiry-based learning being applied to geography and history. A number of schools were reported to have introduced STEM days or weeks where all subjects are taught through the lens of science:

“It has set off a train of STEM days and STEM weeks in schools, so where you would have one or two putting on ‘ad hoc’ STEM weeks, now the degree to which they engage has grown massively.” (Cluster lead)

Improved links with higher education and industry

In some clusters, the programme has facilitated new or improved links between schools and higher education and/or industry that have been sustained beyond the programme. Schools have gained opportunities for visits and open days to provide pupils with ‘real world’ learning experiences. They have also gained a greater awareness of STEM careers and are better placed to offer STEM careers advice through their increased contact with industry representatives. For example, one cluster has organised a collective STEM careers event attended by industry representatives.
Creating lasting links with science based industry

In one cluster, CPD was focused on facilitating links between schools and industry in key sectors such as energy, agriculture and marine. They organised events and visits to local businesses working at the forefront of science based industry such as Sizewell B nuclear power station and the Norwich Research Park.

The schools learned about the different opportunities for pupils to visit these places, and how this can be integrated into their own teaching. Furthermore schools learned about local STEM careers and current apprentice opportunities for young people.

Access to a network of schools

The programme has provided valuable opportunities for inter-school networking where science leads have come together to share ideas and resources and collectively address common challenges:

“All the events that we have held as part of ENTHUSE have brought together science leads from lots of different schools - they are creating a community of science leads in the borough.” (Cluster lead)

There are examples where the programme has acted as a springboard to further collaborative projects. One cluster has established a 'hub' where teachers can share lesson plans and ideas of things to do in the classroom. They have created a bank of resources and are in the process of building a website where work can be uploaded and shared. In another cluster, the schools have implemented a system of skills exchange, described below.

Collaborative working across schools

In one cluster, the schools developed a system whereby teaching staff could share their experience and expertise with others. They used a survey to identify where different areas of expertise lay and created opportunities for it to be shared across the cluster. For example, a teacher with a passion for astronomy was supported to go into primary schools to deliver workshops and showcase examples of space photography.

Furthermore, the programme has, in some cases, acted as a catalyst for wider collaborative opportunities. For example in one cluster the schools have committed to collectively undertake the PSQM award over the coming year and will retain a system of mutual support established through the programme.
Learning applied to other subject areas

Although less widely reported, there was some evidence that the learning and experiences gained from the programme has added value for the wider school curriculum. For example, visits to science based industry have multiple applications across other subject areas such as geography and environmental studies. Cluster activities that have promoted opportunities for outdoor learning can also usefully be applied to other subject areas.

Impact on pupils

Data collected through the final programme survey reveals that teachers perceive the programme to have had a number positive impacts on pupils, including increased awareness of STEM careers, and increased confidence, engagement and attainment in science. As figure 3 reveals, over two thirds of respondents agreed or strongly agreed with statements in this respect.

Figure 3: Respondents’ agreement with statements about the impact of ENTHUSE on pupils

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to raise pupil awareness of STEM careers</td>
<td>32%</td>
<td>35%</td>
<td>15%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase pupil progress in science</td>
<td>29%</td>
<td>56%</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase pupil attainment regarding science</td>
<td>29%</td>
<td>53%</td>
<td>3%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase pupils’ confidence in science</td>
<td>32%</td>
<td>56%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase pupils’ engagement in science</td>
<td>44%</td>
<td>53%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Base = 34
Our interviews with cluster leads provided qualitative evidence of some of these impacts, however interviewees were more reluctant than the teachers in the survey to make claims about increased attainment. Cluster leads did however highlight some additional positive impacts and these are discussed in the following sections.

**Increased enjoyment/engagement with science**

Cluster leads reported that pupils were having improved experiences of science as a result of it being taught in a more engaging way:

“Children are being scientists rather than just completing the worksheet.” (Cluster lead)

One cluster lead observed that pupils were “demanding better teaching and learning” since being exposed to more exciting teaching as well as opportunities for extra-curricular activities and external visits.

In at least two clusters there was evidence of schools displaying greater engagement with their pupils to shape the way science is taught. One cluster consulted pupils who had recently undergone the transition from primary to middle school. They found that pupils’ enjoyment of science dipped at middle school as they tended to conduct less practical activities. Middle schools were therefore encouraged to retain this approach to science. A similar approach to improving pupils’ experience is presented in the following example:

**Pupils shaping the way that science is taught**

In one cluster, the schools asked their pupils to describe their favourite and least favourite things about science. Most commonly, the pupils said that the best bit about science was going outdoors to learn, which prompted many of the schools to improve their outdoor learning areas.

**Access to wider STEM learning opportunities**

Pupils have gained from having increased access to STEM related industry and organisations. Examples include:

— Schools working with employer partners to fund extracurricular STEM clubs

— Links forged between schools and higher education institutions which have created opportunities for collaborative projects and activity days

— Training ‘STEM ambassadors’ who support and encourage pupils to engage with STEM subjects through clubs and activities

— Visits to a local businesses made possible by the links built through the programme

— Inviting local scientists to come into the schools and give talks to pupils.
There was also evidence of schools implementing more creative ways of engaging pupils in science outside of the classroom, such as in the following example:

**Implementing a cluster-wide science blog**

In one cluster, a collective blog page was created to which all schools in the cluster could contribute blog posts. The aim was to raise the profile of science within the schools by providing pupils with a space to showcase their work. It was also intended to enable a community of science leaning where pupils could share and communicate across the schools.

**Improved attainment and skills**

Many cluster leads felt unable to comment on the programme's impact on pupil attainment due to lack of hard evidence available, acknowledgement of the difficulties isolating the impact of ENTHUSE from other activities, or a belief that it is too early to say.

However, cluster leads did observe that pupils had improved key thinking skills and expected this to be reflected in their future attainment. For example, one lead covered a lesson within a participating school and was impressed by the level of skill the pupils had acquired in undertaking enquiry:

“I could tell they were experienced in [undertaking] enquiry. I asked them to plan their own enquiry…they were capable of planning, collecting evidence and presenting what they had found”. (Cluster lead)

In one cluster, the application of new learning activities in secondary schools (as suggested by the CPD tutor) is thought to have improved students' skills in science literacy. Teachers have started to use scientific articles as a basis for classroom discussions and this has reportedly improved pupil's speaking and listening skills in science.

In a minority of clusters, teachers have fed back results of assessment levels, as reported in the following example:

**Improved attainment in primary science**

One cluster identified a number of primary schools for inclusion in the ENTHUSE programme because they were low performing in their science results. The cluster lead felt that one of the key reasons the schools were struggling was because their overly ridged approach to learning. The knowledge and skills gained through the programme enabled teachers to explore the full breadth and depth of the curriculum. At the end of the programme all schools reported a greater proportion of pupils achieving higher levels.
Improved transitions

Several clusters have sought to improve pupils' experiences of transitioning across schools. One cluster has implemented a CPD course around Assessment for Learning (AfL)

“Our cluster work focused on building a common Assessment for Learning across schools, so when they [pupils] did move on, teachers would really care about what their learning level was.”

In at least two clusters teachers in different tiers of schools have begun to work collaboratively, for example by introducing shared science days and joint resources. This was seen to support smoother transitions for pupils, as shown in the following example:

Supporting transition planning for primary and secondary teachers

One cluster implemented a programme of activity to develop a common approach to assessment and facilitate more effective transitions between KS2 and KS3. These activities included: collaborative transition planning; joint monitoring of year 6 and 7 work; and developing a 'common language'.

As a result of the programme, the schools have developed long-lasting relationships and will continue to meet regularly over the coming years. Teachers have established a common approach across the key stages so that there is familiarity for pupils when they join a new school (for example in the key terms used). Teachers also identified overlaps in content to ensure that secondary lessons are building on, and not repeating, the learning at primary level.

The cluster lead reported a more consistent application of level criteria at the end of KS2. As a result, secondary teachers have greater confidence in the skills of new pupils which has enabled them to raise their aspirations for them.
4. Facilitators and barriers

Facilitators

Support from senior leaders

Cluster leads observed that the extent to which schools engaged with the programme was an indicator of how far they achieved the intended outcomes. They stressed the importance of gaining senior leader buy-in from each school to facilitate sustainable impacts. Where school leaders were seen to prioritise the ENTHUSE programme, teachers were not only given permission to attend programme activities but were better supported to disseminate the learning across the school.

Having senior-level support also facilitated the smooth running of the cluster activities. In one cluster for example, having the head teachers attend the CPD sessions enabled the group to make more timely decisions together about future planning. Furthermore, senior leader buy-in was seen as a key factor in determining whether teaching staff would go on to undertake further CPD opportunities:

“If senior management aren’t behind them [teaching staff] won’t go” (Cluster lead)

Enthusiastic teaching staff

Programme successes were driven by the commitment of key teaching staff who were willing to act as champions for the programme within their schools. Enthusiastic individuals were credited with disseminating learning to other teachers, implementing new projects and sourcing opportunities. Cluster leads noted that where a school did not have an allocated staff member willing to lead on the work, the programme had the least impact.

“It was the strong will and enthusiasm of the subject leader [that made the impact]. She showed me the photographs of her projects and talked about the events she has done and how inspired she felt after the CPD.” (Cluster lead)

PSQM award

In clusters where schools had undertaken the PSQM award (either prior to, or alongside the ENTHUSE programme) this was shown to facilitate greater commitment to implementing learning and achieving sustainable outcomes for teachers, schools and pupils.

Schools undertaking both programmes have benefitted from the overlap and continuity between them, with each programme building on the other and driving commitment:
“They had worked with the science consultant throughout the PSQM and ENTHUSE; that longevity and consistent engagement helped the schools put science at the forefront of development.” (Cluster lead)

Furthermore, the PSQM award added a layer of accountability for schools, that would otherwise be absent in the ENTHUSE programme. The PSQM award requires schools to submit evidence that they have implemented their learning against clear milestones. This helps teaching staff prioritise their development work against the competing commitments of everyday school life.

The requirement for schools to pay a fee for the PSQM (either in part or full) was also felt to secure a school’s commitment to the work. In the experience of one cluster lead, having schools invest something (even if only a proportion of the fees) made a real difference to their level of engagement.

**Experience and expertise of cluster lead/host organisation**

The experience and expertise of the cluster leads and their host organisations has enabled them to get the best value from the ENTHUSE funding. For example, one cluster lead talked about how they drew on their vast experience of running similar projects to produce a slick programme of activities with minimal burden placed on schools:

“We made it easy for them. We are very organised and had it all laid out two months in advance. We had a timetable so there was no excuse [to not attend].” (Cluster lead)

In some clusters it was through the connections of the cluster lead that schools gained access to science based industry and higher education institutions as well as other schools.

Schools have also benefitted from the wider range of activities undertaken by cluster leads and their organisations that will help embed and sustain the ENTHUSE programme, for example the launch of a STEM careers strategy in one cluster and a Common Assessment Framework in another. The programme has also acted as a springboard to new activity such as applying to be a Maths cluster (a national programme), made possible by the experience of the cluster lead.

**Additional resources**

Several cluster leads noted that their host organisation had invested resources over and above the initial ENTHUSE programme grant to ensure the success of the programme. One lead estimated that their organisation had matched the grant funding and had used the money to secure schools’ engagement, for example by funding teachers’ transport and supply cover.
These cluster leads predicted that their programmes would not have achieved the impacts they did had they not made the additional investment. Cluster leads saw this as a positive investment and a demonstration of how the ENTHUSE money had been used to ‘pump prime’ a wider array of activities.

Barriers

Programme logistics

The most common barrier highlighted by cluster leads was the challenge of securing high attendance at CPD and other activities by teaching staff. Cluster leads noted that some head teachers were more receptive to releasing teachers than others, which was a barrier to effective programme planning.

Although undertaking activities collectively was most desirable, cluster leads often formed small groups of schools by location or type to increase participation. They observed that attendance at CPD was higher when it took place within schools or other local venues, therefore limiting travel time. One cluster rotated its learning and meetings around the schools to ensure that all had equal opportunity to engage.

Having a timetable for the CPD activities prepared far in advance (giving schools time to arrange teaching cover) was seen as an effective way to increase participation. Some cluster leads suggested that if there had been a longer lead-in time for the programme it would have enabled more effective planning, for example by coordinating common inset training days across the schools.

Programme timings

Some cluster leads reported a long delay between applying for the programme and receiving the funding. By the time the funding was confirmed, some teaching staff had moved on from their positions, meaning that cluster leads had to re-establish relationships, which led to some delays.

Some cluster leads also commented that it was challenging to undertake all their intended activities within the timeframe for the programme. Others felt that the programme didn’t allow enough time to evidence the longer term impacts of the programme for pupils. This was also raised by some teachers who responded to the survey. One suggestion put forward was to run the programme on a 15 month cycle to allow for a couple of planning months, followed by a full academic year of activity, and a month to write up the final evaluation report.
School resources and capacity

Cluster leads agreed that the capacity and resource challenges facing schools was a key barrier to achieving the desired impacts of the programme. Teaching staff on the programme were juggling a number of competing demands, and their capacity to engage with the programme was dependent on them being given the time and space to commit to it.

The challenge of releasing teachers to attend CPD, particularly in primary schools, was highlighted across the clusters, with one cluster lead arguing that ‘no amount of money’ could resolve this challenge. Some had explored the option of hosting CPD activity in the evening but found that this also clashed with competing demands from extra-curricular activities.

One cluster lead working with low performing schools and schools in special measures noted that these schools found it even more challenging to engage fully with the programme. They felt that they did not have the capacity to invest in science when skills such as numeracy and literacy are higher priorities for Ofsted.

As well as having the time to attend CPD, it was critical that teaching staff had the opportunity to implement their learning. Cluster leads observed that the impact of the programme was low where teaching staff attended CPD but were too busy to put it into practice.

Several cluster leads pointed to the value of having more than one teacher from a school participating in the programme, as staff turnover can stilt or end a school’s engagement. They also underlined the importance of schools embedding changes in their systems in order to build long lasting relationships and outcomes from the programme.
5. Sustainability

This chapter sets out our findings on the extent to which clusters are intending to continue the work made possible by the ENTHUSE award.

General perceptions about sustainability

The cluster leads, with one exception, felt that the programme would be sustained, and in some cases spread, following the end of the funding period. This is backed up by the findings of the third survey (Figure 4).

**Figure 4: Respondents’ agreement with statements on the sustainability of the programme**

```
<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My school&quot; is well-placed to continue improving teaching and learning in science when ENTHUSE funding ceases</td>
<td>53%</td>
<td>44%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Leaders&quot; at my school are more likely to support subject specific CPD as a result of involvement in the ENTHUSE cluster programme</td>
<td>41%</td>
<td>47%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Base = 34

The vast majority of respondents agree that their school is well placed to continue to improve teaching and learning in science that their leaders will continue to support subject specific CPD. This is being achieved in a variety of different ways which we have summarised below.

A continued commitment to work as a partnership

Many cluster leads reported that the schools in their cluster will continue to work collaboratively to improve teaching and learning in science. In some clusters, this is a continuation of pre-existing activity which has been enhanced by the ENTHUSE award. Other clusters have formed a network of teachers from scratch and are working collectively to share good practice, as illustrated in the following comment:

"The aim of the project, as well as delivering CPD to teachers, was to establish a network of science teachers … It is hoped that these meetings will allow teachers to share good practice and undertake a needs analysis to provide CPD across the town in the future. One area that
the cluster has already identified is the new curriculum and a meeting has been scheduled in the new year to discuss the exam boards’ provision”. (Cluster lead)

Activities to sustain and embed the programme

Several cluster leads identified specific activities that they are intending to take forward in coming months, including:

— Implementing a STEM careers strategy across the locality
— Implementing a common assessment framework for science which has been developed as a result of the programme
— Linking more closely with the local science learning partnership and continuing to access resources from the National Science Learning Centre
— Refining and improving the teaching and assessment of science at key stages 2 and 3, and continuing to ensure complementary approaches are used
— Continuing to develop local resources to promote better teaching in science
— Continuing to promote and use outdoor learning (including using newly purchased equipment) for STEM subjects.

In most clusters, partnership activity is being continued without additional funding, however two cluster lead organisations talked about opportunities to access different funding streams as a means of building on the success of the programme.

Spreading the impact of the programme to other schools

Several cluster leads talked about how they were already, or were planning to, extend collaborative CPD activity to other schools in their locality, as illustrated in the following comments:

“The work and the findings from the cluster project will be rolled out to all schools in [name of locality]…Science hub meetings have been set up and the work started in the project will be continued in these hub meetings. All the schools involved in the project will be joining the hub meetings to share ideas…”

“The resource kit that the funding has purchased means that we can continue to promote outdoor science learning to local schools…Potentially this could be extended to other areas within the city to benefit those schools further away…”
Using the programme as a springboard for other improvement activity

Several cluster leads highlighted ways in which the ENTHUSE award has led them to engage in other improvement activities, such as the Primary Science Quality Mark award scheme. One cluster lead organisation has been successful in its bid to lead a local science partnership, and has also been successful in its application to become a maths cluster (a national scheme), both of which will help continue improvements in the teaching and learning of science.

“The opportunities we have progressed as a direct result of our involvement with the Enthuse Cluster projects will enable us to continue and extend the work we have started. We are incredibly excited by what lies ahead of us as a partnership of schools and we are very grateful to NSLC and MyScience for kickstarting our journey”.

"
6. Conclusions and Recommendations

This chapter sets out our conclusions and recommendations and responds to the three evaluation questions.

What has been the impact of the programme on pupils, teachers and schools?

The evaluation has evidenced a wide range of positive impacts generated by the programme. As would be expected, the type and scale of impacts varies across clusters and is related to their intended outcomes as well as the extent to which they experienced the facilitators and barriers described in chapter 4. Across the programme, we found credible and convincing evidence that the programme has delivered the following impacts:

- **For teachers**: increased their confidence, knowledge and skills to teach science, including a move away from ‘worksheet learning’ to practical and/or outdoor learning as well as enquiry based learning. This is supported by an increased awareness of and exposure to additional resources and contacts (including other teachers, industry experts and science learning centres), a more reflective approach to teaching, and for some, an increased appetite for subject-specific learning and development.

- **For schools**: increased the profile of STEM subjects in many schools and clusters; enhanced opportunities for collaborative working across schools; greater alignment of teaching and assessment across school transition points; and improved links with higher education and industry, which has in turn has increased knowledge of science-related careers and opportunities.

- **For pupils**: increased some pupils’ enjoyment and engagement in science, resulting from new approaches to teaching within their school and, in some cases, greater access to ‘real world’ learning opportunities outside their school. There is some anecdotal evidence of improved attainment, however many feel that this will be evidenced later down the line as new approaches become embedded in schools.

To what extent has the programme met its aims?

**Aim 1: Support the move to school to school CPD while encouraging clusters to engage with local science learning centres and partnerships**

The programme has been successful in encouraging school-to-school CPD. There are numerous examples of how schools are collectively sharing learning and practice, whilst also drawing on the support of local and regional science learning centres. In some cases, the programme has enhanced existing CPD and partnership activity, and in others it has created new opportunities for school to school CPD.
**Aim 2: Enable groups of schools to work collaboratively in sustainable partnerships on improving teaching and learning in science**

All but one of the cluster leads felt that the partnerships and relationships which have been developed or enhanced through the programme will, for the most part, be sustained in the absence of ENTHUSE funding. A small number of clusters have plans to expand their partnership so that the benefits of new ways of working and collaborative learning can be shared more widely.

**Aim 3: Increase reach by engaging schools which previously have not engaged with the National Science Learning Network (NSLN).**

The programme has certainly increased schools’ awareness of the NSLC and enhanced take up of CPD opportunities at the NSCL and regional science learning centres during and beyond the timeframe of the programme. Cluster leads were uniformly positive about the CPD received from the regional and national science learning centres, and some teaching staff plan to access additional CPD through these routes.

**Are there any differences of impact relating to different structures of clusters eg size of cluster or school phase?**

The clusters were quite diverse in terms of lead school/organisation, number and types of schools involved, prior history of collaborative working, and geographical location. Additionally, they each had a set of specific aims which were tailored to their own particular circumstances and needs. This makes comparison across clusters challenging as they cannot be easily grouped. Our analysis revealed that differences in impact across the clusters is not related to their structure or size, but to the extent to which they experienced the facilitating factors described in chapter 4. Clusters which appeared to have the greatest success were those which were characterised by some or all of the following:

- an experienced cluster lead organisation / school, who ensured that cluster activity was underpinned by effective planning and logistics
- strong senior-level support from schools, which was central to teaching staff being released to participate in CPD and, importantly, put their learning into practice
- enthusiastic teachers who would champion the programme in their school and share their learning with others
- alignment with other activities aimed at improving teaching and learning in science such as the primary science quality mark.
Recommendations

The evaluation evidence points to a well-run programme, which most cluster leads and teachers are very positive about. A small number of issues came up which Myscience may wish to consider in the design of future programmes. These are as follows:

— Extending the programme, or at least the final reporting deadline, beyond 12 months. Having a slightly longer programme timeline would allow for more upfront planning, as well as give cluster leads the opportunity to evidence all activities and impacts in their final reports.

“The time-limited nature [of the programme] means that later activities in the summer term are not captured in our final evaluation report.”

— Creating opportunities for clusters to find out about what others are doing, either through a face-to-face event or simply by sharing a written overview with them. One interviewee stated:

“I’d be fascinated to hear what other clusters are doing. What programmes of activity did they do?”

— Facilitating a ‘celebration event’ at the end of the programme which brings clusters together to showcase their work, celebrate success and highlight how they intend to sustain the programme. Several cluster leads would welcome such an event.
Appendix 1: Detailed survey analysis

This appendix presents our findings from three online surveys that were carried out by Myscience. The surveys were designed to investigate participants’ perceptions of the programme at three points in time. Survey 1 was took place shortly after the programme began. Survey 2 was took place mid-way through the programme, and survey 3 took place towards the end of the programme.

Overview of findings

Results from the three online surveys paint a very positive picture of the impact of ENTHUSE. In the third and final survey, participants were asked how much they agreed with a range of statements about the programme. These covered issues including the appropriateness of the programme, the quality of various elements of it, and the impact of the programme on teachers and pupils. In all cases, a high proportion of respondents agreed or strongly agreed with the statements.

Responses to the second survey were also very positive, however a slightly higher proportion of respondents said that they had no view for some of the questions. This is especially true for questions about the impact on pupils. This might be because it was too soon at that stage for impacts on pupils to be realised.

Responses to the first survey were still positive, but a little more mixed. It is still the case that few respondents disagreed with the statements in the first survey, however a sizeable proportion said that they had ‘no view’ for many of the questions. As mentioned above, this may well reflect the fact that it was too soon for participants to make an informed decision about the programme. Participant responses to open questions support this hypothesis.

Analysis of the survey data

Because there was a good deal of variation in the questions asked in each iteration of the survey, it has not been possible to analyse change over time on a question by question basis. We have structured our reporting around the final (and most detailed) iteration of the survey, and use data from the first two surveys to provide context and add commentary where appropriate. This allows us to report the most up to date figures on participants’ perceptions of the programme, while also giving some indication in how these perceptions may have changed over time. Survey 1 received 50 responses, survey 2 received 82 responses, and survey 3 received 34 responses.

2 The dataset includes two additional responses that have been discounted from this analysis because they appear to be test responses. Neither contains any meaningful data.
Programme set up

The following two questions were only asked in survey 1 as they refer to the programme set up:

Before joining the ENTHUSE Award Cluster I was unfamiliar with the work of the National Science Learning Centre/regional Science Learning Centre

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>31%</td>
<td>27%</td>
<td>17%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Base = 48

The broad spread of responses to this question suggests that knowledge of the NSLC was mixed prior to becoming involved in the programme.

The planning for the ENTHUSE Cluster Award was clearly communicated and effectively led

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>38%</td>
<td>60%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Base = 48

Some 98% of respondents agreed or strongly agreed that the planning was clearly communicated and effectively led, while the remaining 2% (one respondent) had no view. This suggests that planning was very well communicated and effectively led.

Perceived quality of CPD

In the third survey, participants were asked how much they agreed with seven statements about the CPD sessions that they had attended. Their responses are as follows:
The responses to these questions are all extremely positive. Notably, 100% of respondents said that the CPD was relevant, and 100% said that the CPD had left them with a desire to attend similar CPD. This suggests that the sessions were very well targeted and were appropriate for the teachers receiving them.

The statement with the least positive response was in relation to teachers’ awareness of STEM career opportunities. While 70% of respondents agreed or strongly agreed that the CPD had raised their awareness, 12% disagreed or strongly disagreed, and the remaining 18% had no view. This is still quite good, and we would expect that this outcome would have been more relevant for some clusters than others.

Results from the second survey also show that the CPD was considered to be high quality and well targeted. Respondents were asked how much they agreed that the climate had been of high quality (61% strongly agree, 34% agree, 5% no view), and how much they agreed that it matched the needs of their school (54% strongly agree, 34% agree, 2% no view). No respondents disagreed with either question.

One reason why responses to the second and final survey were so positive may be that the process was designed around school needs, and respondents were involved in the design of the CPD. In the first survey, participants were asked how much they agreed with the statement “When I joined the ENTHUSE Cluster Award the needs of my school were...
evaluated. I contributed to deciding what CPD was to be a priority.” 19% strongly agreed, 65% agreed, 4% disagreed, 4% strongly disagreed, and the final 8% had no view.

**Evaluation of CPD**

In survey 1, participants were asked whether they thought their cluster had plans to evaluate the impact of the CPD. In survey 2 they were asked whether they have been involved in evaluating the CPD.

**Survey 1:**

<table>
<thead>
<tr>
<th>The ENTHUSE Cluster has clear plans for evaluating the impact of CPD on the learning in science in my school</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strongly Agree</strong></td>
</tr>
<tr>
<td>19%</td>
</tr>
</tbody>
</table>

**Base = 48**

Most respondents (82%) agreed or strongly agreed that they had plans for evaluating the impact of the CPD, however, about one in 5 (17%) had no view. These respondents with no view may have been unaware what the plans were elsewhere in the cluster.

**Survey 2:**

<table>
<thead>
<tr>
<th>I have been involved in evaluating the CPD provided as part of the ENTHUSE Award</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strongly Agree</strong></td>
</tr>
<tr>
<td>38%</td>
</tr>
</tbody>
</table>

**Base = 82**
Most respondents (83%) agreed or strongly agreed that they had been involved in evaluating the CPD. The remainder either disagreed or had no view.

**Impact on knowledge and skills**

In the third survey, participants were asked about the impact of the CPD on their skills, knowledge and confidence:

<table>
<thead>
<tr>
<th>Impact on...</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>The CPD increased my skills to teach science</td>
<td>56%</td>
<td>35%</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The CPD increased my knowledge to teach science</td>
<td>59%</td>
<td>35%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The CPD increased my confidence to teach science</td>
<td>59%</td>
<td>32%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Base = 34

In the same survey, respondents were also asked about the impact of participation of the whole ENTHUSE programme:

<table>
<thead>
<tr>
<th>Impact on...</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase teachers' skills to teach science</td>
<td>53%</td>
<td>38%</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase teachers' knowledge to teach science</td>
<td>56%</td>
<td>32%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase teachers' confidence to teach science</td>
<td>56%</td>
<td>29%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Base = 34

These results show that a very high proportion of respondents thought that their skills knowledge and confidence to teach science have increased as a result of the CPD and the ENTHUSE cluster programme.

The equivalent questions in previous surveys did not distinguish so clearly between the CPD and other parts of the ENTHUSE programme, however they serve to show that participant
perceptions of the impact of the programme on confidence, expertise and skills have not changed much over time.

Comparing the three surveys, one notable observation is that in the first survey a much higher proportion of respondents chose ‘no view’. The qualitative data collected later in this survey suggests that many of these respondents chose this option because the survey was conducted too early for them to witness any impacts. This is consistent with the observation that the number of respondents choosing ‘no view’ sharply declines following the first survey.

![Survey 1: base = 48, Survey 2: base = 82](chart1)

**Teachers in my school are demonstrating improved confidence/expertise in the teaching of science as a result of CPD accessed through ENTHUSE**

Survey 1: 8% Strongly Agree, 48% Agree, 10% Disagree, 16% Strongly disagree, 10% No view
Survey 2: 23% Strongly Agree, 56% Agree, 10% Disagree, 3% Strongly disagree, 6% No view

Survey 1: base = 48, Survey 2: base = 82

![Survey 1: base = 48, Survey 2: base = 82](chart2)

**The teaching of science in my school has improved though involvement in the ENTHUSE cluster project**

Survey 1: 10% Strongly Agree, 48% Agree, 6% Disagree, 35% Strongly disagree, 16% No view
Survey 2: 24% Strongly Agree, 55% Agree, 5% Disagree, 9% Strongly disagree, 16% No view

Survey 1: base = 48, Survey 2: base = 82

**Engagement in science-related CPD and teaching activity by colleagues in their clusters**

Data from the third survey shows a high level of agreement that participation in the programme has helped to improve teacher networks, their reflective practice and collegiality between cluster schools.
There is little difference in the proportion of responses given across these three questions, suggesting that the programme has had a similar impact in all three areas.

Questions asked in the first two surveys investigated whether the conditions existed for networks to develop and ideas to be shared.

In the first survey, participants were asked how much they agreed with the statement:

“I have clear plans for sharing the CPD I experienced with other teachers in my school.” 33% strongly agreed, 63% agreed, and 4% had no view.

In the second survey, they were asked:

“The cluster leader has shown flexibility in planning the CPD sessions and in addressing the needs of partner schools.” 52% strongly agreed, 41% agreed, 6% had no view.

“My school has made it possible for me to share the learning from ENTHUSE Award CPD with other members of staff.” 44% strongly agreed 44% agreed 6% disagreed, and 6% had no view.

The responses to these three questions suggest that one of the reasons why responses in the third survey were so positive is that participants had plans to share their learning, and were working in a supportive school environment where cluster leaders were helping to plan CPD flexibly.
Development of the curriculum, resources and assessment

In the third survey, respondents were asked how much they agreed with three statements about the impact of the ENTHUSE cluster programme on the way that teaching is delivered.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>No view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase interdisciplinary learning approaches where science can be incorporated into a range of common topics</td>
<td>38%</td>
<td>50%</td>
<td>3%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to provide more varied approaches to science learning and teaching</td>
<td>44%</td>
<td>50%</td>
<td>3%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Participation in the ENTHUSE cluster programme has helped to increase science activities in the curriculum</td>
<td>38%</td>
<td>59%</td>
<td>3%</td>
<td>3%</td>
<td></td>
</tr>
</tbody>
</table>

Base = 34

These responses show that across all three questions, the vast majority of teachers thought that the ENTHUSE cluster programme had impacted upon science teaching, by increasing interdisciplinary learning approaches, making teaching more varied and by increasing science activities in the curriculum.

Impacts for pupils

In the third survey, respondents were asked about the impact that they thought the programme had had on pupils in their schools:
Responses to all of these questions were very positive. At least two thirds of respondents agreed or strongly agreed with each statement. The question with the most positive response was “participation in the ENTHUSE cluster programme has helped to increase pupils' engagement in science”. Close to half of respondents strongly agreed, and 97% of respondents either agreed or strongly agreed.

The statement which received the least positive response was "participation in the ENTHUSE cluster programme has helped to raise pupil awareness of STEM careers". 67% agreed or strongly agreed, 15% disagreed, and 18% had no view. This tallies with the earlier result that teachers’ awareness of STEM career opportunities for pupils was the question that received the lowest proportion of agreements.

Two questions were asked in survey 1 and 2, which cover similar issues to those presented above from survey 3. In both survey 1 and 2, respondents were asked how much they agreed with the following statements:

“Pupils in my school have shown greater engagement in science since the ENTHUSE project began”.

— Survey 1: 6% strongly agree, 50% agree, 6% disagree, 38% no view
— Survey 2: 24% strongly agree, 52% agree, 6% disagree, 17% no view.
“Pupils in my school have shown greater achievement since the ENTHUSE project began (higher standards; better rates of progress)”.  
— Survey 1: 6% strongly agree, 42% agree, 8% disagree, 44% no view  
— Survey 2: 17% strongly agree, 51% agree, 5% disagree, 27% no view.

These results show that as time passes an increasing number of respondents agree with these statements, and a decreasing number of respondents have no view. This suggests that towards the beginning of the programme quite a few respondents did not yet know how it would turn out, but as time passed, most of these thought that it was effectively helping to raise pupil engagement and pupil achievement.

**Legacy**

Two questions in the third survey asked about sustainability once the programme has ended.

```
"My school" is well-placed to continue improving teaching and learning in science when ENTHUSE funding ceases  
53% 44% 3%

"Leaders" at my school are more likely to support subject specific CPD as a result of involvement in the ENTHUSE cluster programme  
41% 47% 12%
```

Base = 34

These results show that most respondents think that their school is well placed to continue improving after the programme ends. Most also think that leaders in their school will be supportive of future subject specific CPD programmes.

**Open comments**

In addition to the questions reported above, participants were given the opportunity to comment on what was going well about the programme, and what could be improved. These questions were asked in all three surveys. We analysed the data by coding responses into categories. These categories were identified in an emergent fashion from the data: new categories were added as needed so that each response could be fully coded. Each response was coded into as many categories as appropriate.

We found a number of similarities across the three surveys about what is perceived to have worked well about the programme. Sharing best practice/ideas and networking are two very
common themes that were repeatedly cited as good aspects of the programme in all of the surveys. Other common responses were collaborating with other schools (or building links between primary and secondary schools) and taking part in the CPD activities.

Some themes varied a little over the course of the programme. For example in the first and second survey, quite a few respondents said that resources and practical teaching suggestions had been among the best aspects of the programme. In the third survey, this figure was a bit lower, with only two respondents bringing this up. This does not necessarily mean that opinions of the resources have worsened, it may instead be that other aspects of the programme were more present in teachers’ minds when they filled in the third survey.

Compared to the responses regarding what has gone well about the programme, there is more variation in the responses about what could have been improved. This is a normal finding, and may reflect that there is broad agreement about what has gone well, but where things have not gone so well, participants have differed in their interpretation of why this is, and how it can be fixed. One area for improvement that was consistently mentioned across the three surveys was that many respondents talked about practical difficulties associated with meeting up or going to programme events. Reasons for this included that it was hard to coordinate inset days, hard to find staff cover, or programme events were organised at inconvenient times. A common recommendation from these participants was that if they could be given even more advanced notice of upcoming events, this might help them to navigate such issues more easily.

In the third survey, a new theme emerged, in which some respondents said that the programme should have gone on a little longer in order to maximise its impact.

In the first survey, many respondents said that they could not think of anything that could be improved, and/or were not yet sure what had gone well. Fewer respondents said this in subsequent surveys. This finding adds validity to the responses as it suggests that respondents were actively thinking about their answers to the survey, rather than simply coming up with things to say for the sake of filling boxes.