NATIONAL STEM LEARNING NETWORK: REGIONAL PROGRAMME

Evaluation report 2015-16

Ben Bryant and Rachel Dunford
Isos Partnership

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During the evaluation, we were privileged to be able to hear from school and subject leaders, teachers and technicians, as well as local, regional and national leaders across the National STEM Learning Network. What all had in common was a fierce and uncompromising desire to improve the teaching and learning of STEM (science, technology, engineering and mathematics) subjects, by empowering educators and enthusing students. Some specific examples that we drew from these conversations are highlighted in this report, providing illustrations of some of our key findings. We are extremely grateful to them for giving their time and insight so generously to this project.

Executive summary

Introduction: Background and aims of the evaluation

In August 2013, the National STEM Learning Network began the third phase of its regional programme. From the summer of 2013 onwards, the regional programme has been led and delivered by fifty Science Learning Partnerships (SLPs) arranged into five regional consortia (each led by a regional operator). The regional programme is funded by the Department for Education.

This evaluation has focused on the effectiveness and impact of the STEM (science, technology, engineering and mathematics) continuing professional development (CPD) for schools and colleges in England delivered by the regional Network between April 2015 and March 2016. Specifically, the evaluation has sought to explore:

a. the ways in which schools and colleges have engaged with the regional CPD programme, and specifically whether the regional Network was sustaining engagement with schools and colleges and expanding its reach;
b. the impact of the regional Network's CPD, both on those who have participated in the CPD from the Network and those who have led CPD within the Network; and
c. how effectively the regional Network has operated, including identifying areas of effective practice that can be built upon to maximise the regional Network's effectiveness.

During the evaluation, we have engaged members of the regional Network including SLP leads, Regional Development Leads (RDLs) and Regional Operators, as well as teachers, technicians and subject leaders in schools and colleges that have accessed CPD from the regional Network. The findings set out in this report have drawn together the evidence we have gathered from these one-to-one interviews, from surveys, from data collected within the Network, and from analysis of data from the National Pupil Database.

Chapter 1: What the regional Network has delivered in 2015-16

In 2015-16, the regional Network has sustained a strong upward trajectory in the amount of CPD that it is delivering. In our previous evaluation, we found that in 2014-15 the regional Network has responded well following the initial transition to the new, SLP-led Network. We argued that the key question would be whether the Network could sustain this upward trend in subsequent years. In 2015-16, we found that the Network had been successful in sustaining this trend, increasing its level of CPD delivery by 45% compared to 2014-15, and surpassing the levels of CPD delivery achieved in previous years. This level of delivery is comparable with that achieved in 2010-11, under a mature regional Network led by the Regional Science Learning Centres (RSLCs). A similar trend can be seen when one looks at the number of individual teachers and technicians the Network has reached.

The Network has forged new partnerships and networks, through which it continues to establish a local reputation for high-quality STEM CPD. Members of the Network told us that they were more confident than they had been during the previous evaluation about how the Network overall and specific local SLPs had established themselves as a source of high-quality STEM CPD that local schools and colleges were accessing. A key shift we have observed in how the regional Network is delivering CPD in 2015-16 has been a greater focus on delivering CPD through alliances, trusts and other local networks of schools. We also found that there was a far greater focus on using data to track progress against delivery targets.

Members of the regional Network reported stronger engagement from, and levels of delivery to, primary schools and priority schools. Priority schools are schools that have been identified by the Department for Education, using data on attainment in science and progress in mathematics and English, as schools that would be likely to benefit from intensive STEM CPD support. Bursary funding is available to support the costs of the CPD for identified priority schools. Members of the Network have also reported, however, greater challenges engaging secondary schools and post-16 institutions. This is certainly the perception among SLPs, although the data show that the regional Network has exceeded its targets for both the number of primary and secondary schools it sought to engage in 2015-16: 2,671 primary schools against a target of 2,250, and 2,108 secondary schools against a target of 1,350. We suggest what this reveals are the difficulties experienced by SLPs in engaging secondary schools in similar types of CPD to their primary counterparts, such as CPD focused on assessment and the curriculum.

Chapter 2: The impact of CPD delivered by the regional Network in 2015-16

Our evidence suggests that the Network has continued to offer high-quality CPD that participants consider makes a difference to science teaching and learning. We considered the impact of the CPD both on those accessing and benefiting from the regional Network's CPD, and on those leading and delivering CPD within the regional Network.

In terms of the impact on those benefitting from the regional Network's CPD, we found that over nine in 10 (93%) CPD participants who responded to our survey rated the overall impact of the CPD they had accessed as very high or high. In terms of specific areas of impact, we focused on the impact on CPD participants, on their colleagues and institutions, and on pupils.

- **Over nine in 10 teachers, technicians and subject leaders who have accessed STEM CPD from the regional Network considered that the CPD had fulfilled their aims (97%), improved their confidence, knowledge and skills (98%), and had enhanced their teaching or technician practice (98%)**. Moreover, between four and five in ten strongly agreed that the CPD had resulted in impact in these areas. This compares favourably to levels closer to half or two-thirds in the most recent teaching and learning international survey (TALIS). Furthermore, three quarters (76%) of teachers, technicians and subject leaders who had accessed CPD from the regional Network strongly agreed or agreed that the CPD had had an impact on their career development and progression. This presents a strong picture of the quality of the CPD that is offered throughout the regional Network and the impact this is having on STEM teachers, technicians and leaders.

- **Nine in 10 respondents reported that they had shared the learning from the CPD with their colleagues (93%) and that this had an impact on their practice (90%)**. This suggests a high level of impact, and one which compares favourably to the levels of reported impact on colleagues' practice by subject leaders in a previous evaluation of Network CPD we carried out in 2014-15 (63%). We suggest that this may reflect the fact the regional Network has been able to focus increasingly on delivering bespoke CPD, including to a group of or all staff within a school's subject area.

- **Nine in 10 CPD participants strongly agreed or agreed that the CPD that they had accessed from the regional Network had an impact on pupils' engagement in science (91%) and on their progress and attainment (92%)**. In both cases, around 1 in 3 respondents strongly agreed. Eight in 10 reported impact on pupils' likelihood of further study, with 1 in 4 strongly

agreeing about this form of impact. These figures compare favourably to the level of impact on pupils reported in a recent evaluation we carried out of schools that had made the most regular and consistent user of the Network's CPD. This research, published in the summer of 2015, was entitled *Evaluation of the impact of National Science Learning Network CPD on schools*, and is referred to in the remainder of this report as the "super-users" evaluation. In the super-users evaluation, 82% of subject leaders strongly agreed or agreed that the CPD had an impact on pupils, which is similar to the level of reported impact collected through the Network's Impact Toolkit (80%). These are encouraging findings, and may reflect the focus that members of the regional Network have placed on embedding skills of identifying impact on pupils' learning.

In terms of the impact on those leading and delivering CPD within the regional Network, we focused on the impact on institutions that lead SLPs and on institutions in which members of staff had been trained to lead STEM CPD.

- **All SLP leads and RDLs were confident that the schools and colleges that have led SLPs have benefitted significantly as a result**. The vast majority described the beneficial impacts in terms of raising the profile of the host institution and their partners, and establishing their local leadership role. In addition, leading a SLP had benefited some institutions in terms of their ability to recruit and retain high-calibre staff, due to the progression and leadership opportunities for staff to lead CPD and support STEM in other schools. Alternatively, other SLPs had benefited by seeking to take advantage of having a wide range of STEM CPD "on tap" through their links with the SLP to build up the skills and knowledge of the host school's workforce. The National Pupil Database data that we analysed suggested that schools that lead SLPs tend to be high-performing schools, which accounts for why they were chosen to lead SLPs in the first place. The data also suggest, however, that these schools have sustained these levels of performance during the time they have been leading SLPs within the regional Network. Taken together, these findings suggest strongly schools that lead SLPs are also seeing benefits on staff and pupils in their own institutions.

- **Nine in 10 of those trained to lead STEM CPD by the Network strongly agreed or agreed that being trained to lead CPD by the regional Network had an impact on their confidence, skills and teaching (95% of 45 survey responses), and on career development and progression (91% of 43 responses)**. Furthermore, 97% (of 35 responses) strongly agreed or agreed that the CPD that they led had an impact on the teachers and technicians to whom they had delivered it. Teachers, technicians and subject leaders who had benefited from this training and led STEM CPD described the impact had on their confidence and their skills to lead CPD, but also in terms of enabling them to reflect on and enhance their core teaching skills and knowledge base.

Chapter 3: How effectively the Network has operated in 2015-16

Function 1: Establishing a presence and maintaining the brand of the Network

Many SLPs reported that they had made significant progress in establishing themselves as a "go-to" place for high-quality local STEM CPD. They described two things that they have done to establish and grow their local presence. First, they had used large-scale events and conferences to generate interest and forge connections. Second, they had sought to ensure that the experience of accessing CPD from the SLP was a high-quality, impactful experience for teachers and technicians.

Members of the Network also identified two areas in which they would welcome further support. First, they considered that there was an ongoing role for national communications about the Network to reinforce the role of the SLPs and encourage schools and colleges to seek out their local SLP. Second, members of the Network reported that they would welcome a more planned, forward-looking approach to communications within the Network. They saw that this was important in enabling SLPs to manage relationships with their networks and partners sensitively and maturely.

Function 2: Building sufficient regional and local capacity to delivery CPD

In our previous evaluation, we identified five key characteristics that SLPs needed in order to be effective in their role. Since then, these five key characteristics have been built on by the regional Network, and used to develop a maturity model against which SLPs can self-evaluate and identify the areas in which they might wish to strengthen their partnership and build their capacity. During the present evaluation, we found widespread recognition of these characteristics and a strong view that they remain a sound summary of what SLPs need to have in place to continue to fulfil their role effectively. These characteristics and the Network's maturity model appear to have been disseminated effectively throughout the regional Network, and are, in many instances we saw, reflected in how SLPs are operating.

We identified two important shifts of emphasis in terms of what SLPs needed to do to be effective in the "establishing" phase compared to the "sustaining" phase: first, a greater focus on sustaining existing connections with schools and networks to support more strategic uses of CPD, and, second, a greater awareness of the importance of the SLP brand and reputation.

Nevertheless, progress in embedding these key characteristics is not consistent across the Network: SLPs are at different stages in terms of the maturity, strength and depth of their partnerships and networks. Specifically, around half of the SLPs we engaged reported that they were finding it difficult to deploy the teachers and technicians that the SLP had trained to lead STEM CPD, and a small minority reported they were finding it challenging to get the right level of buy-in and active engagement from strategic partners.

Likewise, as in our previous evaluation, we identified three key components of the role of the RDL, which RDLs considered remained an accurate description of what should be the key features of their role. They argued, however, that some RDLs were still heavily involved in day-to-day operational matters, rather than being able to focus on strategic support and challenge to the SLPs. They suggested that having RDLs working across multiple SLPs and ensuring there is a clear distinction between the strategic aspect of the RDL role and any role that person may play in delivering CPD within the SLP. Recent changes to the RDL framework should help to address this.

One unique feature of the regional Network is that it seeks to harness current STEM expertise in schools by training teachers and technicians to deliver STEM CPD to their peers. This has been done through the *leading effective professional development* (LEPD) course, offered as a free-to-access CPD activity by SLPs. More recently, this has been complemented by the *teacher / technician leader development programme* – an enhanced, national development programme to support teachers and technicians who have been trained to lead STEM CPD. Practitioner leaders, whether teachers or technicians, have a vital role to play within the regional Network. During this evaluation, we found that just over two thirds (68%) of those trained to lead CPD who responded to our survey said that they had delivered some STEM CPD as a result. This is positive: it suggests that two thirds of those trained to lead STEM CPD have gone on to play a role in improving STEM teaching and learning in local schools and colleges. Nevertheless, only one in 5 (20%) said that they had delivered CPD *within the regional Network*, compared to 46% who had delivered in their own school and 30% within other

partnerships and networks. This raises a strategic question for the Network about what is expected in return for attending LEPD and whether the way in which LEPD is offered is maximising its contribution to the effectiveness and long-term sustainability of the regional Network.

Function 3: Recruiting to and delivering CPD

In our previous evaluation, the consistent challenge reported to us had been recruiting teachers and technicians to CPD activities. During the present evaluation, we found that SLPs were more confident about delivering the full range of CPD activities and have built capacity to deliver bespoke STEM CPD, and had greater clarity about their delivery targets, of which they were more confident in achieving. As a result of these, as described in chapter 1, the regional Network has continued to increase the overall levels of CPD it is delivering and the numbers of schools and colleges, teachers and technicians it is reaching.

Members of the Network remained concerned, to some extent, about the performance of the regional Network's booking system. They reported that, despite improvements, this continued to be unwieldy for teachers and technicians seeking to book onto CPD activities, and was resulting in bookings being lost. It is difficult to corroborate these perceptions, but some CPD participants did report that the booking system continued to be an obstacle and some SLPs, across a range of regional consortia, described how they were working around the booking system to avoid these issues. Network members also suggested that they would welcome a more collaborative and planned approach to developing the regional Network's CPD programme.

Function 4: Gathering feedback, ensuring quality and impact, and sustaining the Network

During this evaluation, we found an encouraging focus among SLPs on the long-term sustainability of their partnerships and the regional Network as a whole. Specifically, we identified three important shifts in the current evaluation. First, we found that, among SLPs, there is strong focus on the importance of delivering CPD that schools and colleges will pay for. Second, as in previous evaluations, members of the regional Network were very positive about the importance of the Impact Toolkit as a mechanism for encouraging strategic and impactful use of CPD. We found, however, that these messages were becoming more embedded, with wider recognition of how to identify evidence that CPD was making a difference to teaching / technician practices, and improving pupils' learning. The fact that a minority of CPD participants responded 'cannot say' to our survey questions on impact suggest that impact monitoring should remain a priority for the Network. Third, members of the Network argued that there needed to be reflection on the way the regional Network as a whole plans for contingencies, such as avoiding gaps in provision in instances where a SLP lead or another key member of staff is unexpectedly absent for a sustained period of time.

Conclusions

Over the past three years, the Network has undergone a significant transformation. In 2013, the regional Network was re-configured at a time of significant change within the education system as a whole, with changes to school structures, curriculum, assessment, accountability and funding all shaping the way in which schools sought to engage in external, subject-specific CPD. The most significant achievement of the regional Network during this period is that it has sustained itself, re-built its reputation and presence locally, increased its capacity and levels of delivery, all the while sustaining high levels of quality and impact.

These trends were apparent in the final year of previous evaluation, 2014-15, which was the first full year since the transition to the new regional programme, and have been sustained during 2015-16.

The credit for these achievements rests with members of the regional Network, particularly those working within and with SLPs. They also reflect, however, the way in which the regional Network, during this transitional period, has sought out formative feedback through formal evaluation and informal intelligence-gathering, and has used this to make changes and disseminate key characteristics of effective practice.

There remain areas of challenge, however. As the Network moves forward, we suggest that it will be important to continue to focus on communicating effectively about and within the regional Network, building capacity within SLPs and among practitioner leaders, and ensuring the central systems support them to do this. Doing so will help members of the regional Network to meet these challenges and build on their achievements over the last three years.

Summary of key findings

What the regional Network has delivered in 2015-16

- **The regional Network has sustained a strong upward trajectory in the amount of CPD that it is delivering**. It is now delivering levels of CPD comparable to that achieved in 2010-11 by what was, at the time, a mature and well-established network of RSLCs.
- **The regional Network has achieved and exceeded its targets for overall CPD delivery and for the number of teachers and technicians, and schools that is has reached**. In 2015-16, the regional Network has reached 12,431 teachers and technicians. It has also reached 4,858 schools and colleges, including exceeding specific targets for both primary and secondary schools.

The impact of the regional Network's CPD – on those accessing CPD

- **Overall impact** – over nine in 10 (93%) of CPD participants responding to our survey rated the overall impact of the CPD they had accessed from the regional Network as very high or high.
- **Impact on CPD participants** – over nine in 10 teachers, technicians and subject leaders who have accessed STEM CPD from the regional Network considered that the CPD had fulfilled their aims (97%), improved their confidence, knowledge and skills (98%), and had enhanced their teaching or technician practice (98%).
- **Impact on colleagues and institutions** – nine in 10 respondents reported that they had shared the learning from the CPD with their colleagues (93%) and that this had an impact on their practice (90%)
- **Impact on pupils** – nine in 10 CPD participants strongly agreed or agreed that the CPD that they had accessed from the regional Network had an impact on pupils' engagement in science (91%) and on their progress and attainment (92%).

The impact of the regional Network's CPD – on those delivering CPD

- **Impact on institutions leading SLPs** – all SLP leads and RDLs were confident that the schools and colleges that have led SLPs have benefitted significantly as a result. They described this impact in terms of their leadership role in local STEM education, of recruiting and retaining high-calibre staff, and of developing a well-trained staff team within the host institution.
- **Impact on staff trained to lead STEM CPD** – nine in 10 of those trained to lead STEM CPD by the Network strongly agreed or agreed that being trained to lead CPD by the regional Network had an impact on their confidence, skills and teaching (95%), and on career development and progression (91%). Furthermore, 97% strongly agreed or agreed that the CPD that they had led had an impact on the teachers and technicians to whom they had delivered it.

Introduction

Background to the National STEM Learning Network's regional programme

In August 2013, the National STEM Learning Network began the third phase of its regional programme.[1] The regional programme is funded by the Department for Education to provide a programme of high-quality STEM (science, technology, engineering and mathematics) continuing professional development (CPD) for schools and colleges in England. Throughout this report, we use the term 'the Network' to refer to the National STEM Learning Network.

The Network includes the National Science Learning Centre at York, the National STEM Centre, and the regional Network. In August 2013, the Network began a significant transformation of its regional programme. Previously, local STEM CPD was provided through nine regional Science Learning Centres (RSLCs). From the summer of 2013 onwards, the regional programme has been led and delivered by fifty Science Learning Partnerships (SLPs) arranged into five regional consortia (each led by a regional operator). The aim of the new regional programme was to combine the facilities and expertise of the RSLCs with those of successful schools- and colleges-led partnerships in order that science CPD could continue to be made available locally to teachers and technicians in a sustainable and efficient way.

The SLPs play a key role in the new regional Network, which encompasses:

- shaping an offer of CPD to meet the needs of local schools and colleges;
- building networks and partnerships through which to deliver CPD that improves STEM teaching and learning; and
- building leadership capacity locally by training current teachers and technicians to lead STEM CPD for their peers.

They are supported in this role by Regional Development Leads (RDLs), who provide strategic support, capacity-building and challenge, and act as the day-to-day link between the SLPs and the regional operators. Between August 2013 and March 2015, the role of regional operator was held by different organisations:

- Sheffield Hallam University acted as the regional operator for the Derbyshire, Yorkshire and the Humber, and the North East region;
- the University of Hertfordshire acted as the regional operator for both the Central region, and the London and the South East region; and
- STEM Learning acted as the regional operator for both the North West region and the South West region.

Since 1 April 2016, STEM Learning has taken responsibility for acting as the regional operator for all five regional consortia.

[1] At the time, the Network was called the National Science Learning Network and was operated by MyScience, an organisation established in 2004 by the White Rose University Consortium, comprising the universities of Leeds, Sheffield and York, and Sheffield Hallam University. In 2016, the Network was re-named the National STEM Learning Network and MyScience became STEM Learning.

The aims of the evaluation

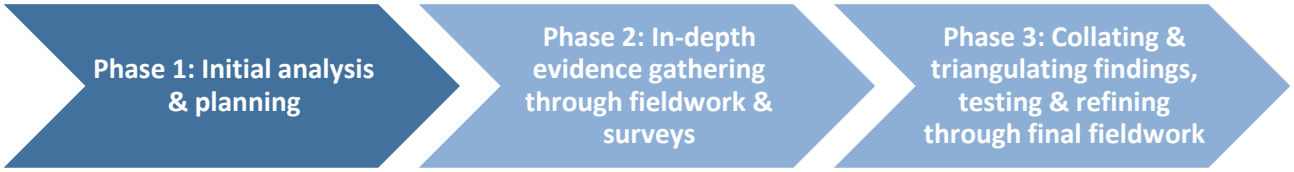
This evaluation has focused on the effectiveness and impact of the CPD delivered by the regional Network between April 2015 and March 2016. Specifically, there were three main aims, which were to evaluate:

a. **the ways in which schools and colleges have engaged with the regional CPD programme**, specifically whether the regional Network was sustaining engagement with schools and colleges and expanding its reach;
b. **the impact of the regional Network's CPD**, both on those who have participated in the CPD from the Network and those who have led CPD within the Network; and
c. **how effectively the regional Network has operated**, including identifying areas of effective practice that can be built upon to maximise the regional Network's effectiveness.

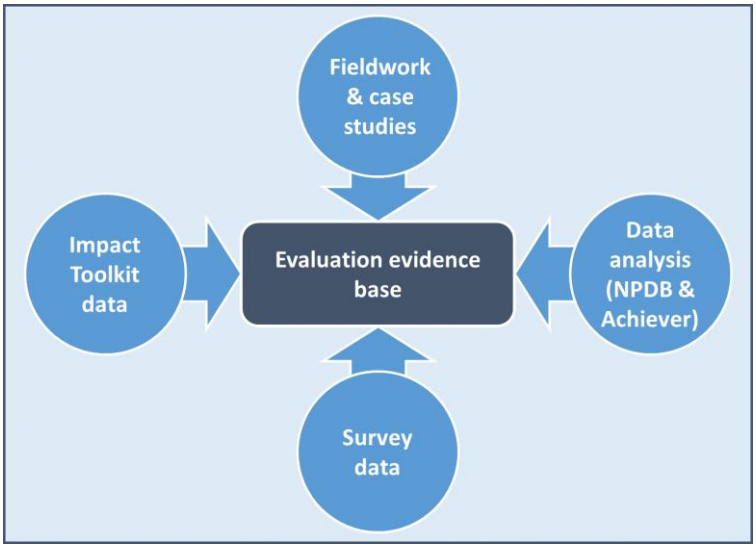
The 2015-16 evaluation builds upon a previous evaluation that we were commissioned to undertake, which focused on the initial transition period between August 2013 and March 2015 when the new regional Network was being established.[2] The present evaluation builds upon the findings of the 2013-15 evaluation, and explores how successfully the regional Network has developed and incorporated the key messages of the earlier evaluation.

Our approach

We approached the evaluation in three distinct phases.



During the evaluation, we sought to collate and triangulate evidence from four different sources. These are shown in the figure below.



[2] Bryant, B., Dunford, R., Parish, N. and Rea, S. 2015, *National Science Learning Network Regional Programme: Final evaluation report, spring 2015*, https://www.stem.org.uk/sites/default/files/pages/downloads/isos%20report.pdf

One of the main forms of evidence we gathered for this evaluation was collected via in-depth discussions with, and surveys of, individuals in a range of different roles and capacities within the regional Network. These have included:

- **Network leaders** – we have interviewed eight SLP leads, seven RDLs, and all of the regional operators in post before 1 April 2016;
- **CPD facilitators** – we have interviewed nine teachers / technicians who have been trained and deployed to lead CPD by the Network, as well as receiving 76 survey responses; and
- **schools and colleges** – we have interviewed nine science and STEM leaders, as well as receiving 117 survey responses from teachers and technicians who have accessed and used STEM CPD in their schools and colleges.

We have complemented this by collating and analysing data from two other sources:

- **the Network's internal data** – in this evaluation, we have used data on the levels of CPD that the Network has delivered (captured in a system called Achiever) and on participants' reported impact (captured via the Impact Toolkit); and
- **the National Pupil Database** – which we have used to look for patterns and associations between schools involved with the regional Network and attainment trends.[3]

The structure of this report

Our findings are set out in three main chapters. **Chapter 1** sets the scene by describing the CPD that the regional Network has delivered between April 2015 and March 2016, and explores whether the strong upward trend in levels of CPD being delivered we saw in 2014-15 has been sustained. **Chapter 2** then draws together the evidence of impact of the CPD the regional Network has delivered. This focuses, first, on those who have accessed CPD and, second, on the impact on the schools and colleges that have acted as leaders within the Network – either leading a SLP or leading specific CPD activities. **Chapter 3** then explores how effectively the regional Network has operated during 2015-16, focusing specifically on the four key functions of a national CPD network.

The role of those who have taken part in this evaluation

Once again, we are grateful to members of the Network, STEM and science leaders, teachers and technicians who have given their time and contributed their views to this evaluation. More often than not, these were genuinely uplifting conversations with individuals who are committed to improving teaching and learning in STEM subjects in their local communities. We hope that this evaluation contributes to that aim.

[3] For our analysis of the National Pupil Database data, we have used the 2015 amended data and the final data for 2013 and 2014 from the National Pupil Database.

Chapter 1: What the regional Network has delivered in 2015-16

In 2015-16, the regional Network has sustained a strong upward trajectory in the amount of CPD that it is delivering

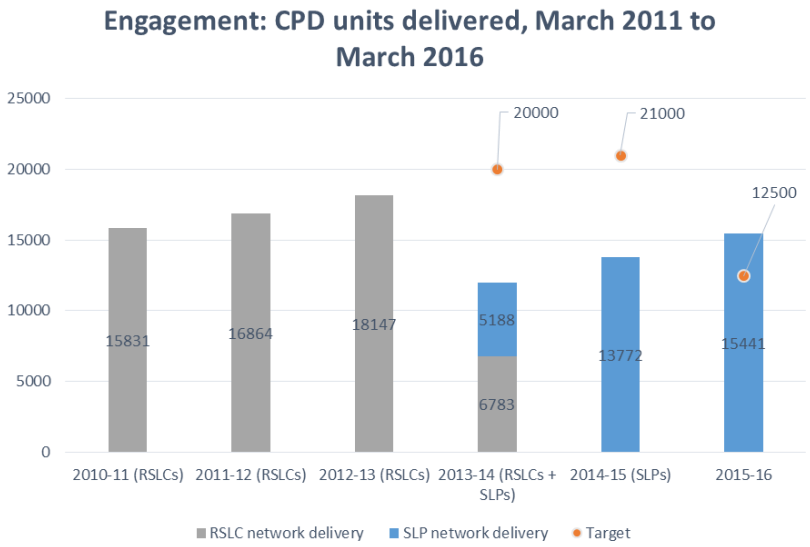
In our evaluation of the regional Network from August 2013 to March 2015, we drew attention to two important points about the overall levels of CPD that the Network had delivered during this time.

The first was to note the impact of the transition from the former delivery model, under the RSLCs, to the new model, led by the regional consortia and SLPs, in 2013-14. The data we presented about the overall volume of CPD delivered by the Network reflected the transitional nature of this period – for example, the number of CPD units (one unit being equivalent to about five hours of CPD) dropped from 18,147 in the final full year of the RSLCs (April 2012 to March 2013) to 11,971 in the first year of the new model. These figures actually mask the impact of the transition, since over half (57%, or 6,783 units) of the units delivered by the Network in the transitional year, 2013-14, were delivered by the RSLCs in the summer term of 2013. During the two subsequent terms – the autumn term 2013 and the spring term 2014 – the new regional Network delivered 5,188 CPD units. As we noted in our previous evaluation, the extent of the transition and the time needed to re-establish the Network on a new delivery model were not fully appreciated at the time, nor was the knock-on effect on what the Network could deliver while undergoing this transition.

The second point, however, was to compare the Network's delivery of CPD in 2013-14 to its first full year of operation, 2014-15. Here, a much stronger and more encouraging picture emerged. Between March 2014 and March 2015, the SLP-led Network more than doubled the amount of CPD that it delivered, from 5,188 units to 13,772 units. This trend was also seen across other measures of the Network's output. This suggested, we wrote, that the Network had learned from the transitional year of 2013-14 and was making good progress in embedding a new approach to the local delivery of STEM CPD. Analysing the Network's performance before the transition, under the RSLCs, we found that there was on average an increase of 15% year-on-year. We took this as indicative of the fact that, even in well-established Networks, reputation, reach and delivery grow incrementally. As such, we argued that the key question would be whether the Network could sustain this upward trend in subsequent years.

The chart below shows that, over the last twelve months, the Network has been successful in matching and surpassing the levels of CPD delivery achieved in previous years. This is a significant achievement for the Network and one that bodes well for the future. As we describe later in this chapter, during our fieldwork, SLPs described how they had reflected on what had and had not worked well during 2013-14 and 2014-15, and had sought to incorporate that learning into how they planned their CPD programmes for 2015-16. The chart suggests that these lessons have been learned well. It shows that the regional Network has increased the level of overall CPD it has delivered by 45% in the last twelve months. Of course, the regional Network achieved a greater year-on-year growth between 2013-14 and 2014-15, but this was from a lower starting-point following the transition to the new delivery model in August 2013. It is important not to underestimate the challenge of sustaining improvement and growth year-on-year, and to recognise the achievement of the regional Network in having done so successfully in 2015-16.

Figure 1: The trend in the number of CPD units delivered by the regional Network from March 2011 to March 2016



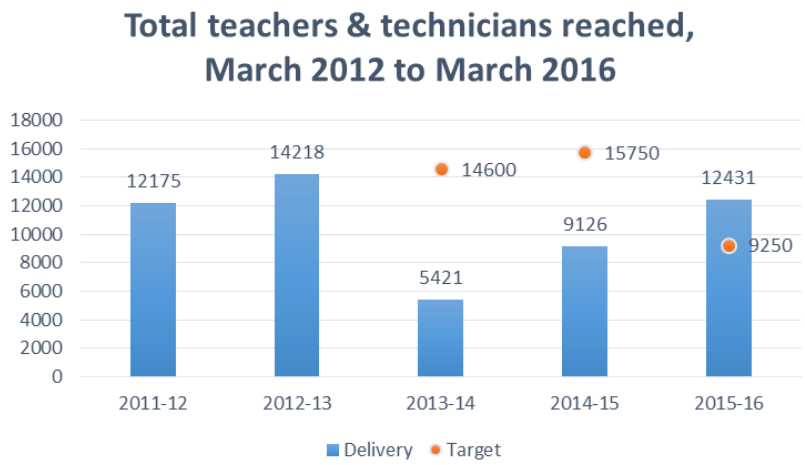
There are two further points to make with regard to figure 1, above. The first is that the regional Network has, in the last twelve months, achieved a level of overall delivery that is comparable with that achieved in 2010-11. This was a time when the regional Network was led by the RSLCs, and was well-established and known widely. This places the success of the new, SLP-led regional Network into context: in just under three years (or eight academic terms), it has successfully re-established itself and achieved levels of delivery comparable with a well-established, mature national CPD network.

The second point to make is that the regional Network has achieved and exceeded its engagement target for 2015-16. The targets themselves have been revised considerably after those set in 2013-14 and 2014-15 – during our previous evaluation, members of the Network reported that these had been set without fully taking into account the impact of the transition from RSLCs to SLPs in 2013. The engagement target for 2015-16 was set based on reflections of what was achievable for the Network in 2015-16. During our fieldwork, we found that members of the Network were more aware of the delivery targets for the SLPs they led or with which they worked, and were using these targets more effectively to plan their CPD offer and activities strategically.

The Network is now reaching more teachers and technicians

A similar trend can also be seen when the focus shifts from the overall amount of CPD units delivered to the number of teachers and technicians that have accessed STEM CPD from the regional Network. As with the chart on CPD units delivered above, the data on the number of teachers and technicians interacting with the Network show a drop during the transitional year in 2013-14, followed by a strong increase that has been sustained in 2015-16. Again, the regional Network has re-built its reach to a level comparable with what the regional Network had in 2010-11, under the RSLCs, and has exceeded its targets for 2015-16.

Figure 2: The total number of teachers and technicians that have accessed STEM CPD from the regional Network between March 2012 and March 2016



The Network has forged new partnerships and networks through which it continues to establish a local reputation for high-quality STEM CPD

Members of the Network told us that they were more confident than they had been during the previous evaluation about how the Network overall and specific local SLPs had established themselves as a source of high-quality STEM CPD that local schools and colleges were accessing. This is an encouraging finding, and reflects the fact that the Network is becoming better established, more mature and more strategic in how it seeks to deliver STEM CPD following the initial transition period from 2013 onwards.

There were two reasons for this. First, members of the Network described how they had considered what had worked well and what had proved more challenging in terms of recruiting to CPD activities during the transition period from 2013 to 2015. In particular, they reflected on the fact that it had proved challenging to recruit leaders, teachers and technicians to traditional, one-day CPD courses. We describe this in more detail in chapter 3, but a key shift we have observed in how the regional Network is delivering CPD in 2015-16 has been a greater focus on delivering CPD through alliances, trusts and other local networks of schools. As we explain in chapter 3, rather than taking a broad-brush approach to planning and marketing their CPD programmes, SLPs are planning their CPD more strategically. They are focusing on planning more specific, targeted CPD engagements, delivering bespoke CPD to individual schools or through groups of schools such as local subject networks and multi-academy trusts (MATs).

Second, we also found that there was a far greater focus on using data to track progress against delivery targets. More SLPs were aware of their targets and how the levels of CPD they were delivering compared to their targets than had been the case during our previous evaluation. The flow of performance information within the Network and the variable use of data to track progress was a feature of the transitional period we highlighted in our previous evaluation, and the Network has, as a whole, taken steps to improve the flow of information and build a more robust culture of delivery. The clear understanding of targets and progress towards achieving those in evidence across the Network is testament to this.

Members of the regional Network reported stronger engagement from, and levels of delivery to, primary schools and priority schools, but greater challenges engaging secondary schools and post-16 institutions

Nevertheless, there is perceived to be an uneven picture in terms of where the regional Network is making greatest headway in forging links, building networks and delivering CPD. This reflects the challenging context in which the regional Network (and indeed all CPD providers) is operating.

The majority of SLPs reported to us that CPD specifically for primary schools (particularly anything focusing on the curriculum or changes to assessment) and for priority schools was delivering well. Priority schools are schools that have been identified by the Department for Education as schools that would be likely to benefit from intensive STEM CPD support and that are not currently being supported through programmes such as the triple science support programme. They are identified using data on attainment in science and progress in mathematics and English. Bursary funding is available to support the costs of the CPD for identified priority schools.

Bespoke CPD to strengthen primary science: Northern Lights SLP

The Northern Lights SLP is part of the teaching school alliance, which is jointly led by Skipton Girls' High School, in North Yorkshire and Feversham College in Bradford.

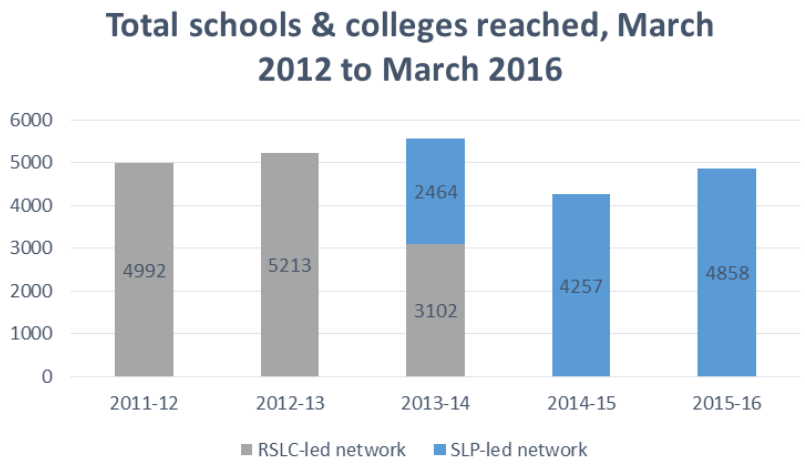
This year, the SLP has enjoyed huge success with their engagement of primary schools by offering CPD in imaginative ways. For example, they have developed series of five bitesize, one-hour twilight sessions, for a cluster of primary schools in Bradford. The focus was on how to 'teach the tricky bits of primary science'. The sessions covered Key Stage 1, lower Key Stage 2, upper Key Stage 2, scientific enquiry, and a cross-curricular session. Primary schools could either send the same person to all five sessions, or could share the CPD between different people. The cluster of schools all bought into the five-session course in its entirety.

A further success has come from some bespoke training for a local primary collective focusing on literacy in science. This was run for four groups of 50 people per session, and consists of three twilights with gap tasks so will reach 200 teachers. The SLP uses a combination of experienced consultants plus practitioner leaders to deliver the programme. The success of these bespoke programmes is enabling the SLP to sustain their primary networks as well as creating a ripple effect as more schools hear about what the SLP can offer them.

They reported, however, that engaging secondary schools and post-16 institutions in STEM CPD was proving more challenging. They attributed this, in part, to the availability of free CPD for secondary schools that was being offered by examinations boards. The one exception to this were CPD activities specifically for STEM technicians in secondary schools.

The Achiever data partially support these findings. The chart below shows the total number of schools and colleges that have engaged in the regional Network's CPD. The trend here is similar to that described above for overall CPD delivery and for teachers and technicians reached, namely a sustained improving trend from 2014-15 to 2015-16, reaching levels comparable with the latter years of the RSLC-led regional Network.

Figure 3: The total number of unique schools and colleges that have accessed STEM CPD from the regional Network between March 2012 and March 2016



Within the overall figure of 4,858 schools and colleges reached in 2015-16, it is important to note that the regional Network exceeded its targets for both the number of primary schools reached (2,671 against a target of 2,250) as well as secondary schools reached (2,108 against a target of 1,350). The regional Network also reached 133 post-16 institutions against a target of 200.

While this matches what SLP leads described about the challenges of engaging post-16 institutions, this does not chime with the message reported to us by SLPs that secondary schools were less willing to engage in external STEM CPD than their primary peers. We suggest that this reflects the relative difficulty SLPs have had engaging secondary schools in *similar types of CPD* to their primary counterparts, such as CPD focused on assessment and the curriculum. SLP leads did report to us that bespoke CPD, especially where they were able to offer the receiving school bursary funding towards the cost of the CPD, and CPD focused on up-skilling technicians had seen better engagement from secondary schools than other types of CPD. The data provides some support for this explanation. For instance, we know the Network has reached almost 800 STEM technicians, the vast majority of whom will be based in secondary schools, and 201 (against a target of 250) priority schools. Taken together, the messages reported to us by the SLPs and the Achiever data indicate that effective engagement of secondary schools and post-16 institutions will require a different, more bespoke offer of STEM CPD than that for primary schools. In secondary schools particularly, such an approach is likely to be focused on whole-school priorities, which in turn requires more time to be spent on analysing a school's needs and bespoke, in-school delivery, or working through existing subject leader networks.

These challenges reflect a combination of broader trends and factors that we highlighted in our previous evaluation report about the changing patterns of CPD usage among schools. These include the fact that schools (and indeed teachers themselves, given that their remuneration is related to their classroom performance) are less willing to release staff during teaching time, pressure on budgets, and a greater focus on internal CPD within schools' existing networks, such as MATs and other collaborations. SLPs and schools that had accessed CPD from the regional Network reported to us that these trends continued to influence how schools engaged with external CPD, such as that from the Network.

This pattern of the types of CPD that are being delivered and to whom has implications for how the regional Network shapes its future CPD offer. We describe in chapter 3 some of the ways in which SLPs have sought to respond to these challenges.

Chapter 2: The impact of CPD delivered by the regional Network in 2015-16

In this chapter, we set out the impact of the CPD delivered by the regional Network over the last year. We focus, first, on the impact on the "*beneficiaries*" of the Network's CPD – teachers, technicians and subject leaders who have accessed and engaged with CPD, and the subsequent effect on their colleagues, schools and pupils. In the second part of the chapter, we explore the impact of the regional Network's CPD on those who have been involved in *delivering* STEM CPD within the regional Network – namely the impact on schools that have led SLPs and on schools in which staff have been trained to lead Network CPD.

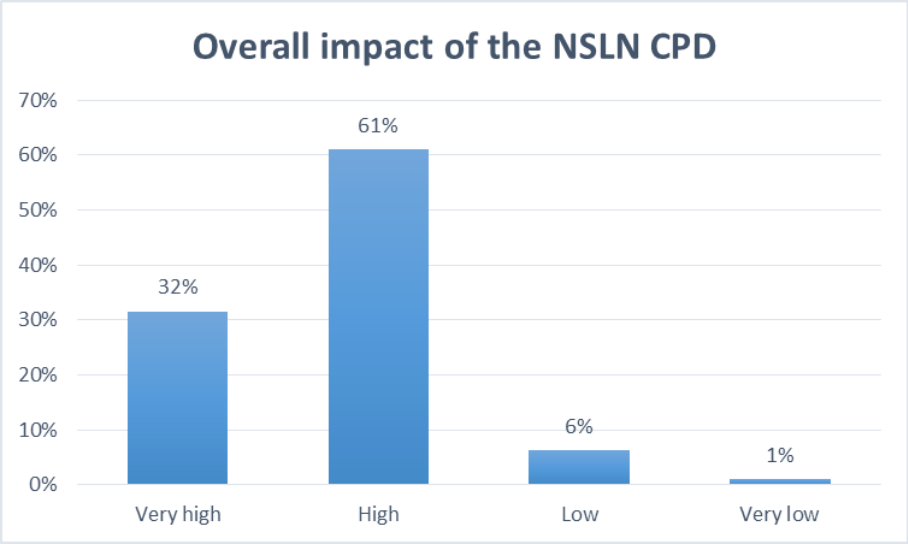
The evidence in this chapter draws on survey data that we collected during the evaluation, as well as telephone interviews conducted with teacher and technician presenters, and with CPD recipients. In presenting the survey data, we have reported the proportions of those who either agreed or disagreed with the survey statement. We have not included those who responded 'cannot say' in the charts and tables, but rather reported the proportion of the total survey respondents who selected 'cannot say' for particular questions. We also draw on data collected by the Network via the Impact Toolkit. Throughout the chapter, we have also used data from other evaluations of the Network and of the impact of CPD to show how the reported impact of the regional Network during 2015-16 compares.

Impact on the beneficiaries of the Network's CPD

There is strong evidence of the overall positive impact of the Network's CPD

During the evaluation, we ran a short survey for teachers and technicians who had accessed CPD from the regional Network. We asked several questions about specific types of impact that may have resulted from the CPD that respondents had accessed. We also asked a question about how they would characterise the *overall impact* of the CPD that they had accessed. The breakdown of responses is set out in the chart below.

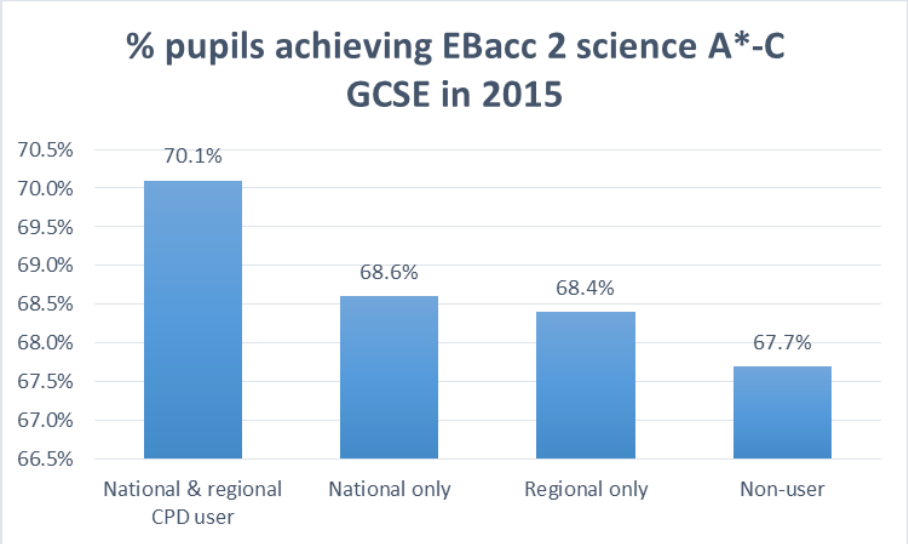
Figure 4: Survey responses regarding the overall impact of the regional Network's CPD (95 responses)



These responses show that just over nine in 10 (93%) of the teachers and technicians who responded to this question in our survey considered that the overall impact of the CPD that they had accessed was high or very high. Many leaders within the Network – national leaders, leaders within regional consortia, SLPs and RDLs – reported to us that one of the key features of the Network, and one which they are careful to maintain, is the quality of the CPD that it offers. The survey responses indicate that those accessing the regional Network's CPD value the quality of the regional Network's STEM CPD and recognise the overall benefits of accessing this CPD strategically. This is consistent with data collected by the Network via the Impact Toolkit – this found that 88% of respondents rated the overall impact of the STEM CPD that they had accessed to be medium or high.

Our analysis of data from the National Pupil Database also suggested that schools that made strategic use of STEM CPD from the Network were more likely to achieve higher results that schools that did not make use of STEM CPD. The chart below, drawn from this analysis, compares the proportion of pupils who achieved grades A*-C in two English Baccalaureate (EBacc) sciences in 2015 in secondary schools in England that accessed CPD from either or both the regional or national parts of the Network, with schools that did not access any Network CPD.

Figure 5: Comparison of the 2015 EBacc results for two sciences for users of CPD from both the national and regional parts of the Network, national only, and regional only, as well as those that have not accessed any Network CPD



It is important to note that the differences between the four groups of schools are small. Nevertheless, the chart shows that a higher proportion of pupils achieve A*-C EBacc two sciences in schools that access CPD either from the national part of the Network *only* or from the regional Network *only* (between 68% and 69%) than schools that did not access any CPD from the Network. An even higher proportion of students achieve this level, however, in schools that access CPD from *both* the regional and national parts of the Network. The three-year trend data, which shows an overall decline for all schools, also suggests that those schools that have accessed CPD from both the national and regional parts of the Network have seen a smaller decline than those using national or regional only, and those that have not accessed CPD from the Network.

We should not overstate the importance of this finding, nor do we seek to attribute causality. Equally, we need to treat the data carefully, due to changes in assessments and measures in Key Stage 4 science assessments. Nevertheless, the data suggest that a higher proportion of pupils achieve grades between A* and C in EBacc two sciences in schools that make use of CPD from the Network than those that do not. Furthermore, those schools that make full use of the Network's CPD offer, drawing on

both the offer at the National Science Learning Centre and local SLPs, achieve better results than those that use only part of the Network.

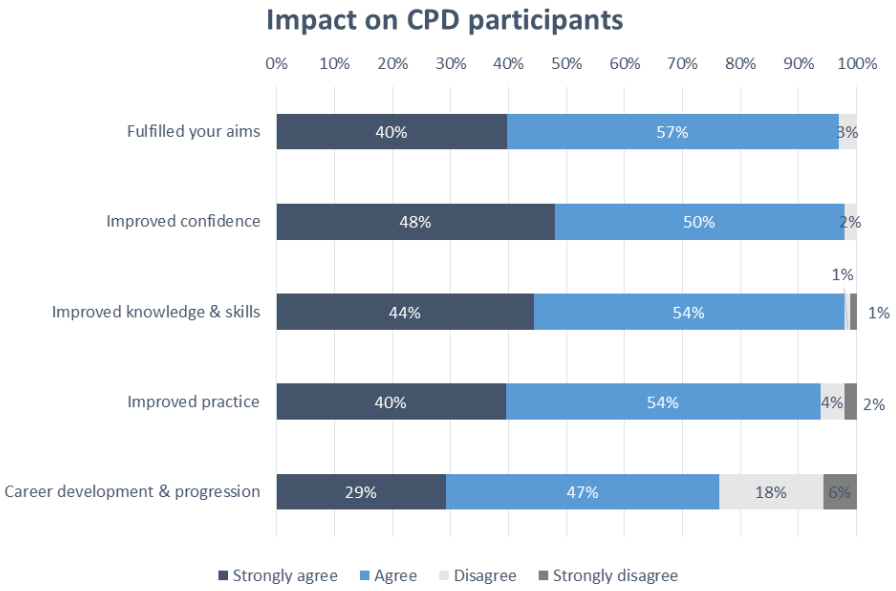
This is suggestive of two things. First, this points to the strength of the Network's CPD offer, and the way in which the regional programme complements what is on offer at the National Science Learning Centre and other national parts of the Network. Second, this trend also corroborates one of the key findings from our 2015 evaluation of the schools that had made the most regular and consistent user of the Network's CPD, referred to in this report as the "super-users" evaluation. The super-users evaluation found that schools that are strategic, discerning and purposeful in their planning and use of STEM CPD are more likely to see higher levels of impact.[4]

The data in figure 5, above, suggest that schools that are drawing on the full range of CPD offered by the Network, both nationally and regionally, and selecting the CPD that is most appropriate for their needs, on average achieve higher levels of attainment than schools that only use part of the Network's CPD offer or do not use the Network at all.

The impact on teachers, technicians and subject leaders participating in the CPD

Many members of the Network, subject leaders and CPD participants have reported to us that the most important indicator of impact of CPD is on the knowledge, skills and practice of teachers and technicians. Their view was that, if a school has teachers and technicians operating in the classroom and with their peers with more confidence and with new expertise that they can embed within their practice, this is going to have a knock-on effect on the practice of their peers, on the engagement of their students, and ultimately on teaching and learning in STEM subjects.

Figure 6: Survey responses regarding the impact on CPD participants



[4] See Bryant, B. and Parish, N. 2015, *Evaluation of the impact of National Science Learning Network CPD on schools*, https://www.stem.org.uk/sites/default/files/pages/downloads/Super%20users%20evaluation%20final%20report.pdf

As such, in our survey of CPD participants, we asked teachers, technicians and subject leaders who had accessed CPD from the regional Network to identify the impact the CPD had on them. Our findings are set out in figure 6 above. We had between 98 and 100 responses to these questions.

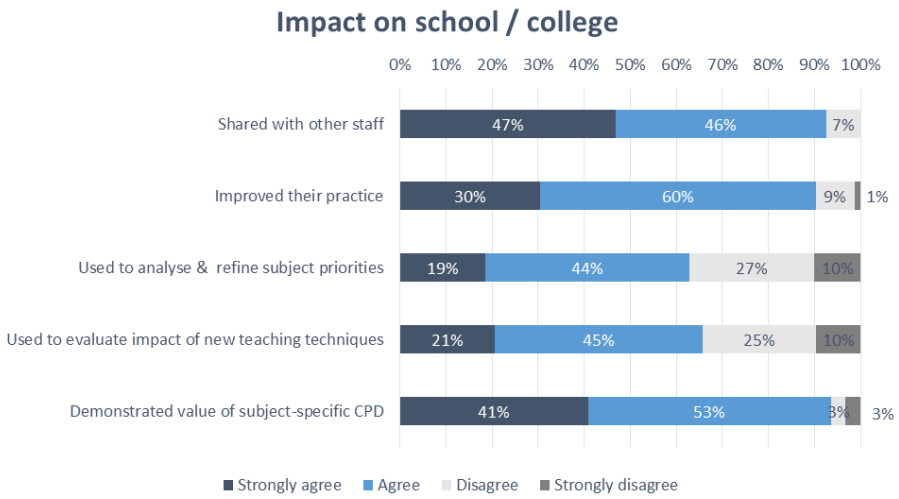
The survey data show that over nine in 10 teachers, technicians and subject leaders who have accessed STEM CPD from the regional Network considered that the CPD had fulfilled their aims (97%), improved their confidence, knowledge and skills (98%), and had enhanced their teaching or technician practice (98%). This compares favourably to levels closer to half or two-thirds in the most recent teaching and learning international survey. This presents a strong picture of the quality of the CPD that is offered throughout the regional Network. It is consistent with the levels of impact (88%) subject leaders reported on CPD participants that we found in our super-users evaluation, to which we referred earlier. It is also consistent with the data collected by the Network through the Impact Toolkit, which found that 96% of CPD participants identified a medium or high impact on their knowledge and skills, and 87% on their practice. Even more encouragingly, across these four questions, between 4 and 5 in 10 respondents not only agreed, but agreed strongly with the statements about the impact the CPD had on them. This is indicative of the value teachers, technicians and subject leaders place on the STEM CPD on offer throughout the regional Network.

The fifth area of impact about which we asked CPD participants was impact on their career development and progression. In previous evaluations, this had proved an area that CPD participants and their subject leaders found difficult to identify impact. Often this is because the impact is both less immediate and more personal to the individual CPD participant – for example, a CPD activity focused on STEM leadership may benefit a member of staff who, twelve months later, wishes to progress to a leadership position. As such, it is perhaps unsurprising that one in 10 (11%) of survey respondents could not say whether the CPD had an impact on their career development and progression. Nevertheless, of those who could identify an impact, three quarters (76%) of teachers, technicians and subject leaders who had accessed CPD from the regional Network strongly agreed or agreed that the CPD had an impact on their career development and progression. As a point of comparison, in the super-users evaluation, only 60% of subject leaders strongly agreed or agreed that the Network CPD had an impact on their staff career development and progression.

The impact on colleagues and on schools / colleges

One of the most important ways in which schools and colleges maximise the impact of STEM CPD is by sharing the learning from the CPD in a planned and structured way with other colleagues. This can ensure that the benefits are not confined to the practice of the member of staff who attended the CPD, but are embedded in classrooms across the school or college. For this reason, in our survey we asked the CPD participants to describe the impact the CPD that they had accessed had on their colleagues and on their school or college. The responses are set out in figure 7 below.

Figure 7: Survey responses regarding the impact on schools and colleges



Nine in 10 respondents reported that they had shared the learning from the CPD with their colleagues (93%) and that this had an impact on their practice (90%). This suggests a high level of impact, and one which compares favourably to the levels of reported impact on colleagues' practice by subject leaders in the super-users evaluation (63%). We suggest that this may reflect the fact the regional Network has been able to focus increasingly on delivering bespoke CPD, including to a group of or all staff within a school's subject area. This can enable those delivering the CPD to focus on encouraging more strategic planning and use of STEM CPD, and to enable colleagues to work together to share their learning and embed this within their collective practices.

The responses to the questions about using CPD to analyse subject priorities and evaluation new techniques seem to support this. In terms of the impact on wider, whole-school strategic use of CPD, around two in three CPD participants reported that the CPD had had an impact on analysing subject priorities (63%) and evaluating the impact of new techniques and practices (66%).

Improving literacy in science through bespoke CPD: The Voyager Academy

The Voyager Academy is a sponsored academy for around 1,400 pupils aged 11-18 in Peterborough. As a priority school, the school was eligible for an intensive bursary to be used towards the costs of STEM CPD from the Network. The school worked with the Cambridge & Peterborough (CaPe) SLP to shape some bespoke CPD engagements that would benefit the school. This included CPD focused on improving literacy in science, which was delivered as a whole-department CPD session. According to the subject leader, the experience of the CPD has made all staff more aware of the need to build literacy into their lessons, and to have practical skills and strategies for supporting students with their literacy and checking on their progress. It has helped not only the subject leader to be more confident in working with and support other members of staff, but also to reflect on and refine subject priorities, particularly in relation to helping pupils to understand how to approach extended answer questions. The subject leader reports that, in recent tests, students in Years 10 and 11 were more confident in approaching these extended answer questions. As she said, 'the Network's CPD is very good, particularly the way in which it encourages you to reflect on what you have done differently as a result of the CPD and the impact that this has had.'

It should be noted, however, that almost 1 in 5 respondents (18%) said that they could not say whether there had been an impact on the practice of their colleagues. Furthermore, 30% could not say whether

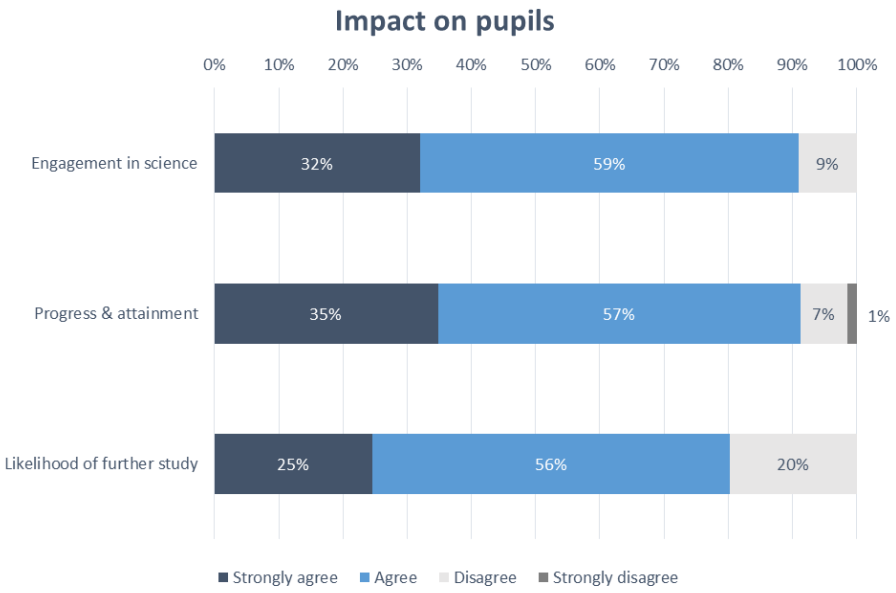
there had been an impact on subject priorities and 27% could not say whether there had been an impact on evaluation of new techniques and practices.

These responses are likely to reflect the fact that, for some participants, the nature of the CPD (e.g. if it had been focused on their individual development needs as a newly-qualified teacher or someone teaching outside their main subject area) may not have lent itself to sharing at a whole-department level. It may also reflect that their roles within the school made it difficult for them to comment on the impact on subject priorities and what happens in other classrooms. The regional Network offers a wide range of CPD for STEM educators in different roles and within different foci: the survey data overall presents a positive picture about the impact on wider school practice and priorities, while the proportions responding 'cannot say' may in part reflect the sheer variety of the regional Network's STEM CPD offer.

The impact on pupils

The members of the Network and CPD participants whom we engaged considered that delivering high-quality STEM CPD that embeds learning in the practice of teachers and technicians will ultimately have a positive impact on pupils' learning. The data we have collected supports this contention, as set out in figure 8 below.

Figure 8: Survey responses regarding the impact on schools and colleges



Nine in 10 CPD participants who could answer questions about impact on pupils strongly agreed or agreed that the CPD that they had accessed from the regional Network had an impact on pupils' engagement in science and on their progress and attainment. In both cases, around 1 in 3 respondents strongly agreed. Eight in 10 reported impact on pupils' likelihood of further study, with 1 in 4 strongly agreeing about this form of impact. These figures compare favourably to the level of impact on pupils reported in the super-users evaluation (82%) and collected through the Network's Impact Toolkit (80%). These are encouraging findings, and may reflect the focus that members of the regional Network have placed on embedding skills of identifying impact on pupils' learning. During the previous evaluation, many CPD participants and subject leaders to whom we spoke described how they might find it difficult to identify evidence of impact from CPD on pupils' learning. As a result, the regional

Network has sought, through the content and delivery of their CPD offer, to reinforce messages about how teachers, technicians and subject leaders can identify evidence of impact on learning.

Using bespoke CPD to embed investigative approaches to science: Stanford-le-Hope Primary School

Stanford-le-Hope is a 3-11 primary school for 400 pupils. It is a sponsored academy, and part of a small multi-academy trust. The school has worked with the local SLP, South Essex Teaching School Alliance (SETSA), to plan and roll out a bespoke CPD opportunity focusing on helping pupils to work scientifically. All teaching staff in the school attended the CPD, led by a subject leader from a neighbouring primary school who had been trained by the SLP. The CPD aimed to provide staff with skills and strategies for enabling students to develop their scientific investigation skills.

As a result of the CPD, the school's subject leader has seen staff in Years 1 and 2 facilitating investigations and practical experiments with greater confidence and skill, underpinned by enhanced knowledge of the subject area. As a result, pupils are more engaged and are developing their skills through observing experiments and asking investigative questions. As one member of staff put it, they are not just learning facts from workshops, but engaged in 'proper science and thinking'. Looking ahead, the school are keen to continue working with the SLP to share and develop these practices across other schools in the trust.

We should note that a significant minority of respondents could not say whether there had been an impact on pupils in one or more of these three categories. For example, 21% of all survey respondents said that they could not say whether there had been an impact on pupils' engagement in science, 30% regarding pupils' progress and attainment, and 38% regarding pupils' likelihood of further study. There are likely to be mitigating factors here, for example related to the timing of the CPD (for some, it will be too early to tell if it will have an impact on pupils' choices regarding further study). Nevertheless, the fact that a significant minority of respondents answered that they could not say whether there had been an impact on pupils suggests that embedding the skills and techniques for evaluating impact on pupils should be an ongoing focus within the regional Network.

Impact on those delivering CPD within the regional Network

The impact on schools leading SLPs

As we described at the start of this chapter, in addition to evaluating the evidence of impact on the direct, intended beneficiaries of the regional Network's CPD – namely staff and pupils in schools and colleges – we also explored the impact on members of the Network responsible for delivering CPD. We turn, first, to the SLPs. The majority of SLPs are led by schools or partnerships of schools, and all schools-led SLPs are led by secondary schools.

We asked the SLP leads and RDLs whom we engaged to describe the ways in which the school that hosted the SLP had benefited from playing this role within the regional Network. All were confident that the host school had benefited in some way. For instance, the vast majority described the beneficial impacts in terms of raising the profile of the host institution and their partners, and establishing their local leadership role. For some SLPs that were connected to well-established teaching school alliances, this had enabled them to expand their offer and establish their leadership of a new subject area. For others, leading a SLP had enabled them to begin to play a new leadership role among peers in other schools. This was seen as beneficial to the host school in terms of raising the profile of their offer to other local schools, colleges and networks.

Establishing a reputation for leading STEM CPD: Norfolk and Suffolk SLP

The Norfolk and Suffolk SLP is led by County Upper School in Bury St Edmonds, a 13-18 academy, which is part of an all-through trust. The SLP comprises a range of partner schools and organisations across both Norfolk and Suffolk.

The SLP has been running since the autumn of 2013, and, having already established a presence delivering high-quality courses for both primary and secondary schools, the SLP delivery of bespoke support has been particularly successful this academic year. They worked with one secondary school who required help with their A Level chemistry teaching, by offering a combination of in-school support at the recipient's school along with coaching and opportunities to test out their teaching at County Upper School. As a result of their close working, the chemistry results were fantastic and the SLP received great feedback from the school's deputy Headteacher: '*We had outstanding Chemistry results this year. We are all absolutely thrilled. Our headline success is outstanding and the value added, particularly in AS, is just brilliant – top 25% nationally!'*

The SLP has become an essential element of County Upper as a school now – it is something they are known for, and has proven to be key to recruiting new staff, who know that they will benefit from excellent subject-specific CPD if they join the science team. In the words of the school's senior leaders, 'we would not be without the SLP now!'

In addition to this, SLP leads and RDLs described two distinct ways in which the host schools had benefited from leading a SLP, depending on the way in which they had interpreted and approached their role.

First, some SLPs have used their role to recruit, retain and develop individual members of staff into STEM system leaders. In other words, they have created within the structure of the SLP opportunities for staff who wish to take on system leadership roles, using their expertise in STEM subjects to support staff and departments in other schools and colleges. In many instances, these are SLPs linked closely to teaching school alliances, which enable them to designate these individuals as specialist leaders of education and deploy them to work with other schools.

The benefit to the host institution is two-fold. First, they are able to offer subject leadership positions with significant opportunities to work across multiple schools, which they report has been attractive to high-calibre candidates seeking to progress in their careers. This means the SLPs are able to recruit aspiring STEM system leaders who can also play a role in improving STEM teaching and learning in the host institution. Second, it offers a range of progression routes for existing staff into positions of responsibility, which in turn can help the host institution to retain existing staff.

The benefits of leading a SLP: George Abbot SLP

George Abbot School is a secondary academy for around 2,000 pupils aged 11-18 in Surrey. The school is part of a small multi-academy trust. In 2014/15, the school joined the National Science Learning Network as the lead for the SLP in the Surrey area. The school see that they have benefited significantly in three ways from leading a SLP.

a. **Understanding the national agenda** – the SLP consider that they benefit from being part of the Network, specifically from the opportunity to hear about national priorities from Network partners, such as the Department for Education, to reflect on these priorities and examples of effective practice from across the Network, and embed new ideas in school.

b. **Building a well-trained science staff team** – given the volume of change to the curriculum, assessment and accountability, the school derives particular benefit from staff being able to attend CPD activities through the SLP and ensure the school is fully prepared for these changes.

c. **Improving practice around transition from primary to secondary school** – last, the SLP lead has been able to foster links with colleagues in primary schools through the SLP. This resulted in work to refine the way in which science is taught in Years 6 and 7 to support students to make a smooth transition to secondary school.

Second, other SLPs have sought to take advantage of having a wide range of STEM CPD "on tap" through their links with the SLP to build up the skills and knowledge of the host school's workforce. They have done this by identifying individual members of staff to become the school's experts on a particular subject area, or on assessment, or on the curriculum, ensuring that they have a well-rounded and broad range of knowledge within their staff to use to improve science teaching and learning and across the school.

Developing science teaching and learning in the SLP lead school: St Marylebone SLP

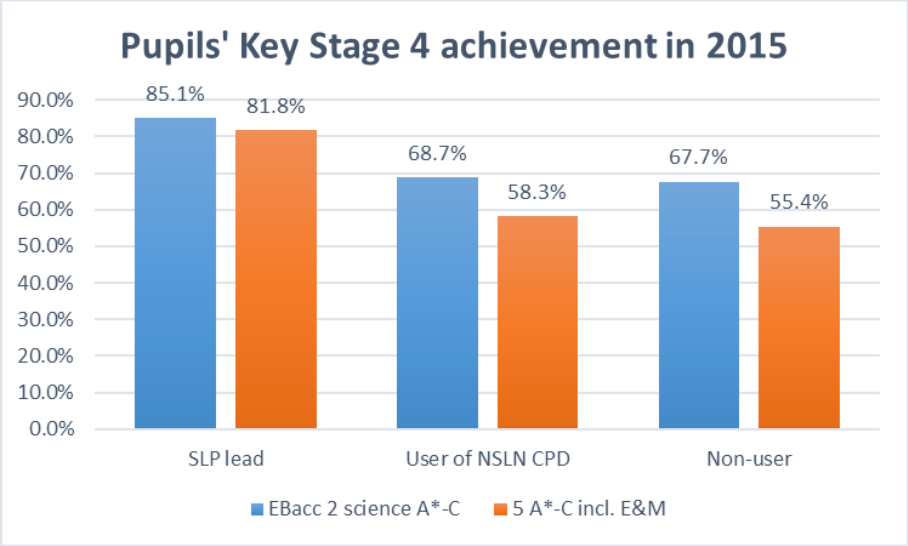
The St Marylebone CE School, Westminster is an outstanding, comprehensive school for girls with a mixed Sixth Form. It is a Teaching School, Maths Hub and the lead for the SLP serving North-West London.

The experience of leading a SLP has bolstered professional development opportunities for the school's staff, particularly in relation to science CPD. The school has been able to benefit from the practice of claiming a certain number of free places in exchange for the school hosting the CPD. In turn, the school has reported, this access to science CPD for staff has had a positive impact on their ability to retain staff.

For example, a biology specialist and key stage lead at the school has now attended four SLP CPD activities, including CPD to enhance subject knowledge in chemistry and physics. These have improved her subject knowledge, but also had a much wider influence. As she put it, 'we have written more chemistry practicals into our schemes of work, as a direct result, and there are some more interesting physics activities being delivered by the whole department now.' She also reflected on the overall value of subject-specific CPD over the course of a teacher's career. 'For example, the chemistry course provided us with a handbook of every practical you can deliver – you can reference it, and go back to it time and time again – it prolongs the impact, and the benefits outweigh the time lost from teaching to attend the course.'

Having heard these examples of the impact on institutions leading SLPs, we sought to corroborate this evidence of impact by analysing the National Pupil Database data for schools that host SLPs. The results are shown in the chart below.

Figure 9: Chart showing pupils' Key Stage 4 achievement in 2015 comparing schools that lead SLPs, that have used Network CPD, and non-users



The chart shows that schools that led SLPs were more likely to have higher levels of attainment at Key Stage 4, both overall and in science. In these schools, 85.1% of pupils achieved grades A*-C in EBacc two sciences in 2015 and 81.8% achieved five A*-C grades including English and mathematics. In other schools that used Network CPD over the last three years, the figures were 68.7% and 58.3% respectively, and in schools that did not use CPD from the Network the figures were 67.7% and 55.4% respectively. This pattern is not surprising: schools that were selected to lead SLPs were those with expertise and a strong track-record in STEM teaching and learning. Many were also involved in leading teaching school alliances. In other words, SLPs by definition are more likely to be high-performing schools overall and in STEM specifically. This is likely to be the reason they were chosen to become SLPs, and we should be careful not to attribute this as an impact of having become a SLP.

What would be useful here is to assess the trend data to show whether there was a pattern that showed whether SLPs maintained or increased their performance in science subjects at the time they had been leading SLPs. This is, unfortunately, complicated by recent changes to Key Stage 4 assessments and accountability measures, which make it difficult to draw out year-on-year comparisons. Due to these changes, there are considerable fluctuations in the data, and, on average, schools show a decrease in the proportion of pupils achieving EBacc two sciences over the last three years. Nevertheless, the data we have analysed does suggest that those schools leading SLPs have seen a less pronounced decrease than other schools.

Clearly there are limitations to using the National Pupil Database data in isolation, and we must be careful not to overstate what the data indicate. Taken together, the patterns in the national pupil attainment data and the findings from our fieldwork make clear that SLPs are seeing a significant impact as a result of leading SLPs. These include benefits on staff recruitment, retention and development, on teaching practice, and, ultimately, on pupils' engagement, progress and achievement.

The impact on schools in which staff have been trained to lead STEM CPD

During the evaluation, we heard a strong set of messages from members of the Network about the potential and likely impact of training current teachers, technicians and subject leaders to lead CPD. Several leaders within the Network – those leading regional consortia and/or acting as RDLs, for example – described the transformative effect being trained to lead CPD had on them and their careers in the past. They described how they saw the early signs of this impact among those who had been trained to lead STEM CPD, and about the potential role this cadre of CPD leaders could play within the Network and within local STEM education. Those who had been trained also described the impact this had on their confidence and their skills to lead CPD, but also in terms of enabling them to reflect on and enhance their core teaching skills and knowledge base.

The impact of leading CPD as a practitioner leader within the Network

A key aspect of the regional Network's strategy is to train up practitioner leaders to lead CPD. Our evaluation shows a range of ways in which teachers, technicians and subject leaders have become practitioner leaders.

For example, a senior leader in a primary school in Cumbria was inspired by a primary science course offered by the local SLP. In his own words, the CPD 'totally changed the way I thought about teaching science, and I really wanted to share that with colleagues'. As a result, he undertook the *leading effective professional development* (LEPD) course and has now delivered courses on primary science to colleagues in local schools. Not only has the feedback been positive from teachers in other schools, but the CPD has also given the senior leader greater confidence to work with colleagues to explain some of the things teachers are less comfortable teaching. Furthermore, it has 'changed the way I teach science', with a high percentage of pupils in his school stating, in a recent pupil questionnaire, that science is now their favourite subject.

In another school in the East of England, an experienced subject leader was attracted to join the school due to the opportunities to lead science CPD within a SLP and to become designated as a specialist leader of education. As a result, she has been able to support a number of local schools. In one instance, she has coached and mentored the subject leader and individual teachers, as well as providing bespoke CPD across the department to embed subject priorities and evidence pupils' progress. As a result, lesson observations show significant improvement in the quality of science teaching and learning.

This goes not just for subject leaders and teachers, but also technicians. We noted in chapter 1 that SLPs reported good levels of delivery of CPD focused on the role of technicians. This suggests not only is there a demand for – and potential benefit of – building the capacity of technicians to support high-quality, investigate STEM learning. It also suggests that there is a leadership role for experience technicians to lead CPD among their peers, as the case study below illustrates.

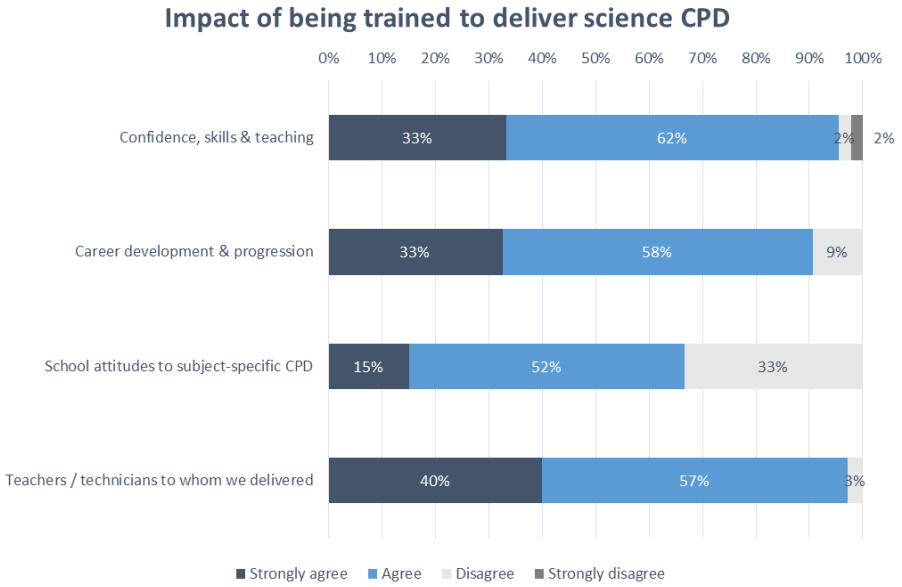
Raising the profile of science technicians through leading CPD: Sandbach High School & Holmes Chapel SLP

Sandbach High School's senior technician is already active in working with other technicians having run a network in the local area. After inviting the local SLP to present to the group to find out more about the CPD opportunities available to them, she was asked to train to become a technician-presenter for Holmes Chapel SLP, and was well-supported by her own school to do so.

She ran her first course jointly with another colleague and, since then, she has solely led other courses. Using the materials provided by the SLP, she was well-prepared for each course, and was able to adjust each one before she delivered them to make sure they were appropriate for her audiences. So far, she has delivered three CPD activities focusing on the role of a science technician and on A level physics. These experiences have given her more confidence in her own work, and in running the local technicians' network. Her skills have developed and her knowledge has improved. Most significantly, however, she reports that the profile of science technicians within her school has been raised through this process.

These findings are corroborated by the survey data we collected. In addition to schools that lead SLPs, through our evaluation we also wanted to explore the impact on those schools in which staff had been trained by the regional Network to lead, and had led, STEM CPD. For this reason, in addition to our survey of CPD participants, we also carried out a survey of teachers, technicians and subject leaders who had been trained to lead science CPD by the regional Network. The responses to that survey are set out in figure 10 below.

Figure 10: Survey responses regarding the impact of being trained to be a practitioner leader

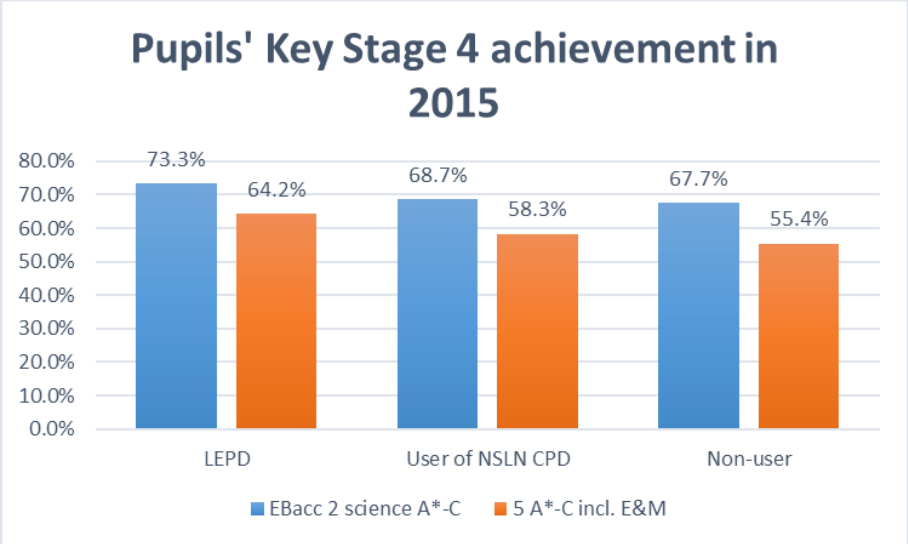


The survey data show that nine in 10 respondents strongly agreed or agreed that being trained to lead CPD by the regional Network had an impact on their confidence, skills and teaching (95% of 45 survey responses), and on career development and progression (91% of 43 responses). Furthermore, 97% (of 35 responses) strongly agreed or agreed that the CPD that they had led had an impact on the teachers and technicians to whom they had delivered it. We did, however, have a small number of respondents (between 7 and 17) who selected 'cannot say' for these questions.

The area where those trained to lead CPD were least likely to agree was on the question of the impact on school attitudes to subject-specific CPD. This is important, as we heard from a number of those who had been trained and had led CPD within the Network that attitudes among school leaders to subject-specific CPD, and specifically to supporting their staff to play a role in leading external CPD, were mixed. Some teachers and subject leaders who had been trained and had led external STEM CPD within the Network considered that some school leaders did not want staff spending time away from the classroom, and would welcome support from the Network in articulating the evidence-base and potential benefits that could accrue to schools in which staff are playing a role in leading external STEM CPD.

As with SLPs, we have also sought to test whether the national pupil achievement data offered any further clues as to the impact on schools of having staff lead STEM CPD. This is made more complicated by the fact that there is not currently data on the *deployment* of teachers and technicians to lead CPD within the regional Network, only data on those who have been *trained* to do so. As we described in the following chapter, deployment rates vary considerably across the regional Network. As such, these data should once again be treated with caution. The results are shown in the chart below.

Figure 11: Chart showing pupils' Key Stage 4 achievement in 2015 comparing schools in which staff have been trained to lead CPD by means of the LEPD course, that have used Network CPD, and non-users



As with the SLPs, a similar pattern appears with regard to the schools in which staff have been trained to lead CPD through the LEPD course. Schools that have accessed LEPD are those in which a higher proportion of pupils achieved EBacc two sciences at grades A*-C and five GCSEs at grades A*-C including English and mathematics than other users of Network CPD and non-users. Nevertheless, this pattern is less pronounced that it is for SLP lead schools. This is likely to be due to the fact that there are more schools that have accessed LEPD than those that lead SLPs, and thus there is likely to be greater variation among the former. We also found that schools in which staff had been trained to lead STEM CPD had, on average, seen a larger rise in their GCSE average points score over the last three years than both other users and non-users of the Network's CPD. They had also, however, seen a slightly larger decrease in the proportion of pupils achieving EBacc two sciences over the last three years. It would be unwise to read too much into these findings, due to the limitations of the three-year trend data and due to the fact that the data does not exist to distinguish those schools in which staff have led external STEM CPD and those who may have accessed the training but not used it. The latter are less likely to be strategic users of CPD, and may have accessed the LEPD course simply

because it was local and free. This practice is not likely to result in any impact for the school in question, but the data does not allow these differences to be teased out.

Taken together, these findings show that the vast majority of teachers, technicians and school leaders who have trained to lead STEM CPD among their peers report that not only has the experience benefited them in terms of their confidence and career development, but has also improved their knowledge and core teaching. This has important implications for school leaders considering how to balance keeping staff in the classroom with enabling them to take advantage of these development opportunities. What the survey data also shows, however, is that the Network would benefit from gathering data on those who are trained *and deployed within the regional Network* to lead STEM CPD, and helping prospective CPD leaders to articulate the benefits to their school leaders.

Chapter 3: How effectively the Network has operated in 2015-16

In the previous two chapters, we have described *what* the regional Network has delivered, and the *impact* this has had on those who have accessed and those who have facilitated this STEM CPD. In this final chapter, we focus on the question of *how* it has achieved this, in terms of evaluating how effectively the regional Network has operated, as well as identifying the key factors where it is performing well. As in our previous evaluation, we have focused on four essential functions of a national CPD network:

1. establishing a presence and maintaining the brand of the Network;
2. building sufficient regional and local capacity to delivery CPD;
3. recruiting to and delivering CPD; and
4. gathering feedback, ensuring quality and impact, and sustaining the Network.

Function 1: Establishing a presence and maintaining the brand of the Network

During the previous evaluation, several SLPs reported to us how they were working to correct a number of myths and misconceptions about the National STEM Learning Network. Potentially most damaging of all was the view that the Network had ceased operating in August 2013, when the RSLCs were replaced by Science Learning Partnerships. Many SLPs reported that the schools with whom they were seeking to work were not aware that this transition had taken place nor of the existence of 50 SLPs working in localities across the country. Significant work was required to overcome this lack of awareness of how the regional Network operated, the STEM CPD it could offer, and how schools could access this.

It was encouraging, therefore, to hear from many SLPs that they had made significant progress in establishing themselves as a "go-to" place for high-quality local STEM CPD. It is clear that, for some SLPs, this experience has been a formative one, involving developing new skills in communicating with and engaging peers in local schools. SLPs described two things that they have done to establish and grow their local presence.

1. **Using large-scale events to generate interest and forge connections** – SLPs have talked about the importance of using launch (or, in some cases, re-launch) events or annual conferences to reach new institutions, subject leaders and prospective CPD participants, to showcase what the SLP can offer, and to gather intelligence on local CPD needs. SLPs have also talked about using existing subject leader network meetings and other engagements with groups of subject leaders as a crucial mechanism for expanding the reach of the SLP and ensuring that the CPD it offers is rooted in the needs of local schools and colleges.

2. **Ensuring a high-quality, impactful experience for teachers and technicians** – having made links with leaders, teachers and technicians, SLPs have also recognised that, in order to sustain these engagements with schools and expand their networks, they need to ensure that those who participate in the SLP's CPD activities see the experience as having been high-quality, professional and, most importantly, having made a difference to their practice. Several SLPs have spoken about how they seek to ensure every step of the process, from booking to the CPD itself to any post-CPD follow-up is managed in a way that meets the needs of CPD participants and enhances the reputation of the SLP.

Members of the Network identified two areas in which they would welcome further support. First, they considered that there was an ongoing role for national communications *about the Network* to reinforce the role of the SLPs and encourage schools and colleges to seek out their local SLP. SLPs saw that this would complement their local work by continuing to raise awareness of the work of the SLPs and how to access their support. In addition, they saw that there might be a role at national or regional level to collate and maintain a database of up-to-date contact details for subject leaders in each local area. This is a significant and ongoing administrative task, and we do not underestimate the time required to fulfil it. Nevertheless, the point made to us during this evaluation, was that some SLPs, RDLs and Regional Operators are doing this already and, in some instances, duplicating efforts. The argument put to us was that co-ordinating this task centrally or regionally would make it easier for SLPs to focus their time on brokering and delivery STEM CPD.

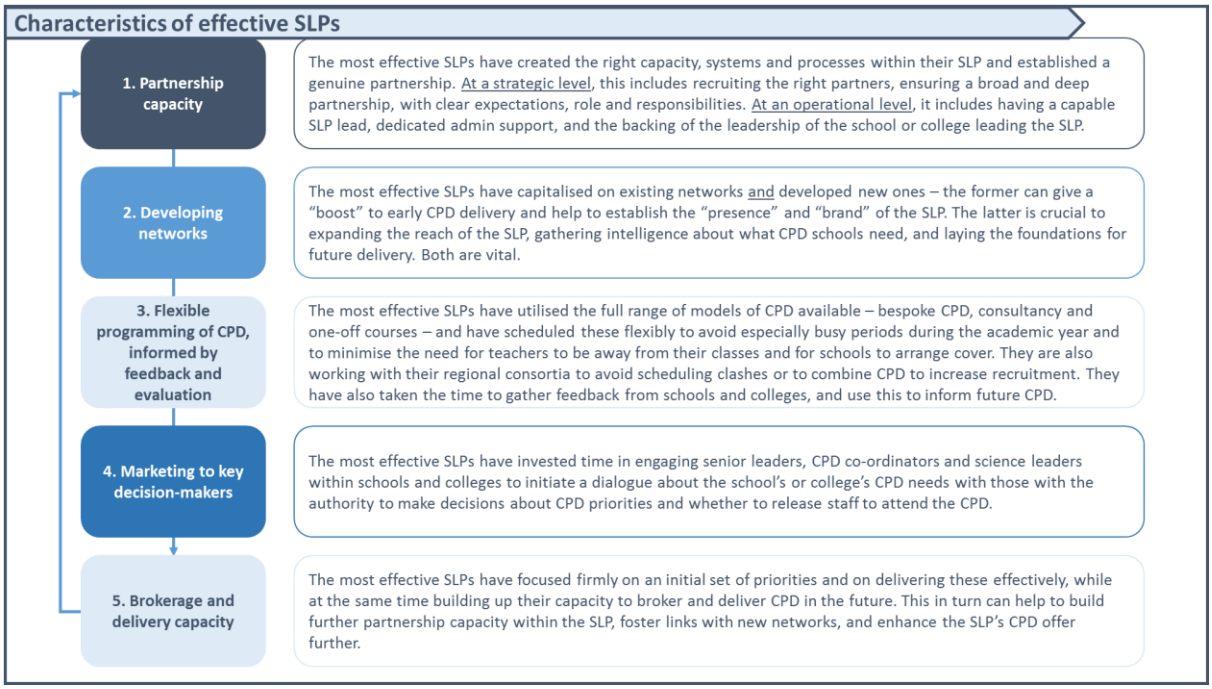
Second, members of the Network reported that they would welcome a more planned, forward-looking approach to communications *within the Network*. Many recognised that the Network operates within a time-specific contract with the Department for Education, which means it is not always possible to have firm long-term plans beyond the life of the current contract. Nevertheless, members of the Network argued that, within this, there could be more dialogue about *planned* activities or changes, such as to the Impact Awards. They saw that this was important in enabling SLPs to manage relationships with their networks and partners sensitively and maturely.

Function 2: Building sufficient regional and local capacity to delivery CPD

Local leadership capacity to plan and co-ordinate STEM CPD: The role of SLPs

In our previous evaluation, we identified five key characteristics that SLPs needed in order to be effective in their role. These referred to the importance of having the right capacity within the partnership to carry out their role and taking a pro-active, flexible approach to navigating the increasingly diverse landscape of school networks and alliances to target their CPD offer to schools' needs. Our original summary of these five key characteristics is re-produced in figure 12 below.

Figure 12: Five key characteristics of effective SLPs



In the intervening period, these five key characteristics have been built on by the regional Network, and used to develop a maturity model against which SLPs can self-evaluate and identify the areas in which they might wish to strengthen their partnership and build their capacity. During the present evaluation, we found widespread recognition of these characteristics and a strong view that they remain a sound summary of what SLPs need to have in place to continue to fulfil their role effectively.

These characteristics and the Network's maturity model appear to have been disseminated effectively throughout the regional Network, and are, in many instances that we saw, reflected in how SLPs are operating. For example, many SLPs have reflected on their approach to building networks (the second key characteristic in our schematic) and flexible scheduling of CPD (the third key characteristic) so that it does not cut across the teaching day. The SLPs we engaged through the evaluation spoke of how they have taken a more strategic approach to planning CPD. As noted in chapter 1, they have reflected on what did and did not work well in previous years. As a result, over the past year (2015-16), SLPs have scheduled fewer traditional-style CPD courses, instead focusing on delivering bespoke CPD and working with subject networks and trusts, while offering CPD in twilight sessions and other times to minimise the disruption to the school day.

Overall, the SLP leads we engaged all reported that their partnerships were stronger, more mature, and delivering more effectively in 2015-16 than they had been during the period immediately following the transition, 2013-15. Nevertheless, progress in embedding these key characteristics is not consistent across the Network: SLPs are at different stages in terms of the maturity, strength and depth of their partnerships and networks. A small number of SLPs were very confident about their model, and considered it reflected most of the five key characteristics. The majority reflected that, while there were some things they were doing well (of which building networks was a common theme), there were other areas that they were finding more challenging. Specifically, around half of the SLPs we engaged reported that they were finding it difficult to deploy teachers and technicians the SLP had trained to lead STEM CPD, and a small minority reported they were finding it challenging to get the right level of buy-in and active engagement from strategic partners.

Lastly on the characteristics of effective SLPs, we explored whether the nature of the role of the SLPs, and consequently what it required to be effective, was different in the "establishing" phase compared to the "sustaining" phase. In other words, were there things well-established SLPs were doing differently now in order to be effective that were different from what they had done when they were establishing themselves. Overall, we found that, in order to be effective, the skills and capacity an SLP needs are very similar in the "establishing" and "sustaining" phases – having a broad and deep partnership, developing networks, strategically targeting CPD decision-makers in schools and so on. We also found, however, that there were two important shifts in emphasis between the two phases.

1. **A greater focus on sustaining existing connections with schools and networks** – the SLPs we engaged recognised that the key to building a STEM CPD offer that was sustainable in the long term lay not only in expanding their reach to new schools, but in building ongoing engagements with schools and networks with whom they had already worked. This in turn required SLPs to work more closely with their existing contacts and networks in order to help their leaders to identify their CPD needs and shape a more bespoke offer of support from the SLP. In other words, SLPs in the "sustaining" phase were focusing more on enabling their partners and local schools to become more strategic users of STEM CPD, and, in turn, the SLP's CPD offer was becoming more bespoke and shaped by the needs of their partners.
2. **Greater awareness of the importance of the SLP brand** – as noted in the preceding section, many of the SLPs we engaged were taking a much more deliberate approach to protecting and

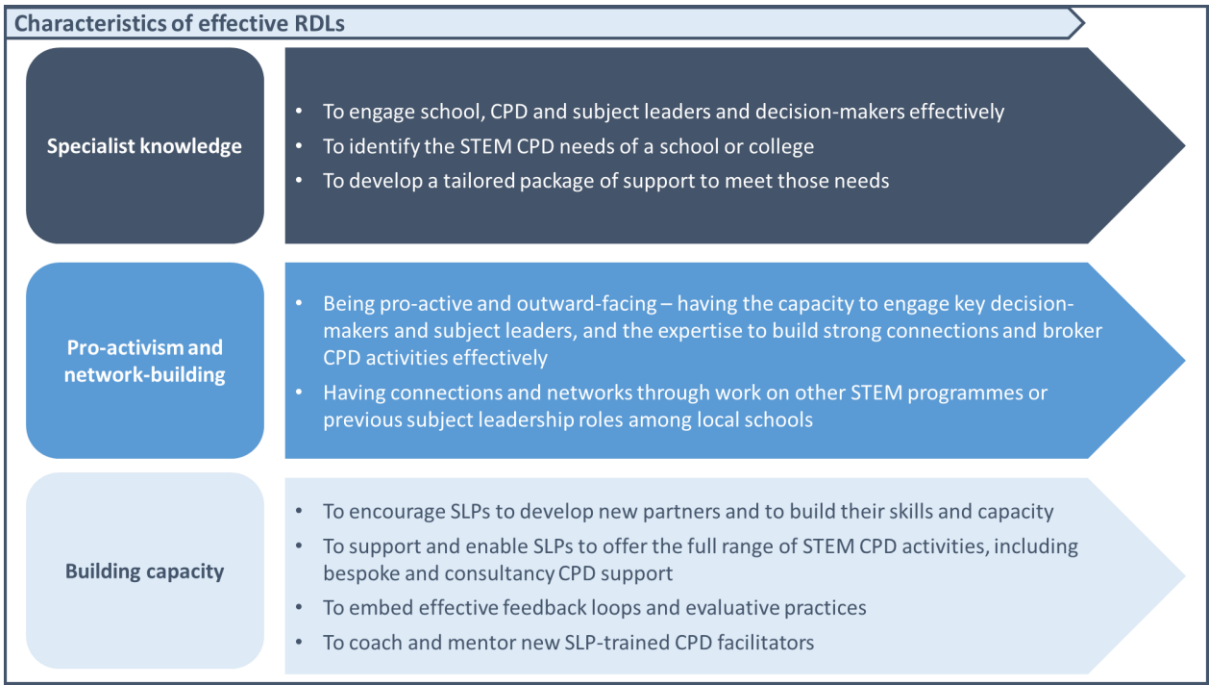
enhancing their brand. They recognised that, having established themselves as a key provider of high-quality local STEM CPD, sustaining themselves relied on continuing to deliver STEM CPD to these standards. Achieving this required that teachers and technicians accessing and engaging in the SLP's CPD had a positive experience throughout, from the time they agree to attend a CPD activity, to receiving any preparatory material, to the CPD activity itself, to the ease with which their learning could be translated into their classroom / technician practice.

As the regional Network continues to develop, an important risk to mitigate is that of over-stretching the SLPs and diverting them from the purpose for which they were established. Capacity – administrative, partnership, leadership, and brokerage – is a key theme within our five key characteristics. SLPs were aware that they had significant responsibilities, and a lot relied on them developing the capacity to fulfil these. As the SLPs become an increasingly well-established part of the National STEM Learning Network, there may be a temptation to add to their responsibilities and ask them to play a role in implementing new programmes. The SLPs we engaged urged caution here: they are keen to play their part in initiatives that will enhance local STEM teaching and learning, but urged that the planning of such initiatives should consider how to ensure SLPs have the capacity and resources to do so.

Local strategic support and challenge: The role of the RDLs

As with the five characteristics of effective SLPs, our previous evaluation also identified three key components of the role of the RDL. These are summarised in figure 13 below.

Figure 13: Characteristics of effective RDLs



As was the case with the characteristics of effective SLPs, the RDLs we engaged were also of the view that these characteristics provided a good summary of what *should* be the key features of their role. We say 'should' deliberately. We found consensus about the key characteristics of an effective RDL. We also found RDLs who considered that they were able to play this strategic, brokerage and capacity-building role. This was also supported by SLPs, who had recognised – and indeed welcomed – the RDLs taking a deliberately more strategic, less "hands-on" role. Nevertheless, other RDLs reported that they were still heavily involved in supporting the SLP on day-to-day operational matters.

RDLs reported that there were two things that would help them to play a more strategic role. First, there was strong support, among RDLs and SLPs, for RDLs working across more than one SLP. At present, there remain some instances where, within a regional consortium, one RDL works with one SLP, another RDL with another SLP, and so on. RDLs and SLPs saw that having RDLs working with multiple SLPs would help the RDL to focus on strategic matters, but would also enable the RDL to facilitate SLP-to-SLP partnership working, such as joint planning and CPD delivery, and peer challenge and benchmarking between SLPs.

Second, in hearing the descriptions of the roles played by RDLs across the Network, it struck us that there is, in some instances, a blurring of the distinction between the strategic role of the RDL in supporting the SLP to develop as a partnership and any role the RDL may play in delivering STEM CPD. For the reasons summarised in figure 13, RDLs are well-positioned and well-qualified to deliver STEM CPD on behalf of the SLP: they have the subject knowledge and often a background in facilitating CPD among teachers and technicians. These are valuable skills, and the regional Network is right to seek to maximise their value. The issue comes about when the strategic role of the RDL is not sufficiently clearly demarcated from another, distinct role that they may play as a facilitator of CPD. In the most effective cases, the RDL and SLP lead are clear that the same person may act as RDL and also be involved in CPD delivery, but that they do so in different capacities and these roles are different. In the most effective examples that were described to us, the RDL has sought to use opportunities when they are facilitating a CPD activity to bring a teacher or technician who has been trained to lead CPD to work alongside them. This helps to build their experience of facilitating STEM CPD, which in turn builds the delivery capacity of the SLP. The regional Network has recently made changes to the RDL framework to ensure that there is a clear distinction between the core, strategic support role of the RDL and any work the same individual may do to deliver specific CPD activities on behalf of a SLP.

Local capacity to deliver STEM CPD: The role of SLP-trained CPD facilitators

One unique feature of the regional Network is that it seeks to harness current STEM expertise in schools by training teachers and technicians to deliver STEM CPD to their peers. This has been done through the LEPD course, offered as a free-to-access CPD activity by SLPs. More recently, this has been complemented by the *teacher / technician leader development programme* – an enhanced, national development programme to support teachers and technicians who have been trained to lead STEM CPD.

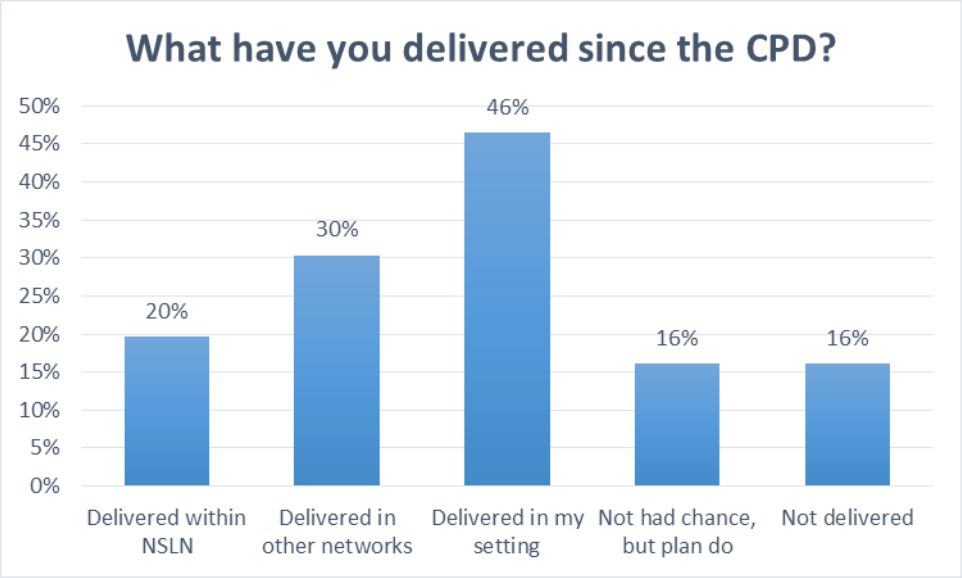
During the present evaluation, we sought to explore two things related to the way in which the role of "teacher leaders" and "technician leaders" – for ease, referred to here as "practitioner leaders" – has developed. First, we sought to understand from the SLPs what proportion of the CPD they delivered was led by a practitioner leader (as opposed to an external CPD consultant). Given that, in the previous evaluation, many SLPs had found it challenging to deploy practitioner leaders, we also wanted to understand what SLPs had found worked well to overcome this challenge. Second, we sought to gather feedback from the practitioner leaders themselves about their expectations and experience of being trained to lead STEM CPD within the regional Network. During the evaluation, therefore, we interviewed nine practitioner leaders who had accessed the national development programme, as well receiving 76 responses to a survey to which all teachers and technicians trained through the LEPD were invited to respond.

The feedback we gathered from the SLPs suggested that the proportion of CPD being delivered by practitioner leaders varied widely across the regional Network. We asked SLPs and RDLs for estimates of this, and received figures ranging from 10% to around 75%. It is a significant strength of the regional Network that some SLPs have been able to recruit and harness current teaching and technician

expertise. These figures suggest, however, that there remains significant variation in the role that practitioner leaders are playing within the regional Network.

The data we gathered through a survey of those trained on LEPD paint a similar picture, as shown in figure 14 below.

Figure 14: Survey responses from those trained as practitioner leaders regarding CPD they had delivered since their training



In our survey, we asked respondents to indicate what they had delivered since they had accessed the LEPD course. Respondents were able to select multiple options (for example if they had delivered within their school and the Network), and thus the percentages in the chart above do not add up to 100%. We received 56 responses in total to this question. Overall, we found that 68% of respondents had delivered some STEM CPD after having been trained on the LEPD course. A further 16% said that they intended to do so, but had not yet had the opportunity. This is positive: it suggests that two thirds of those trained to lead STEM CPD have gone on to play a role in improving STEM teaching and learning in local schools and colleges.

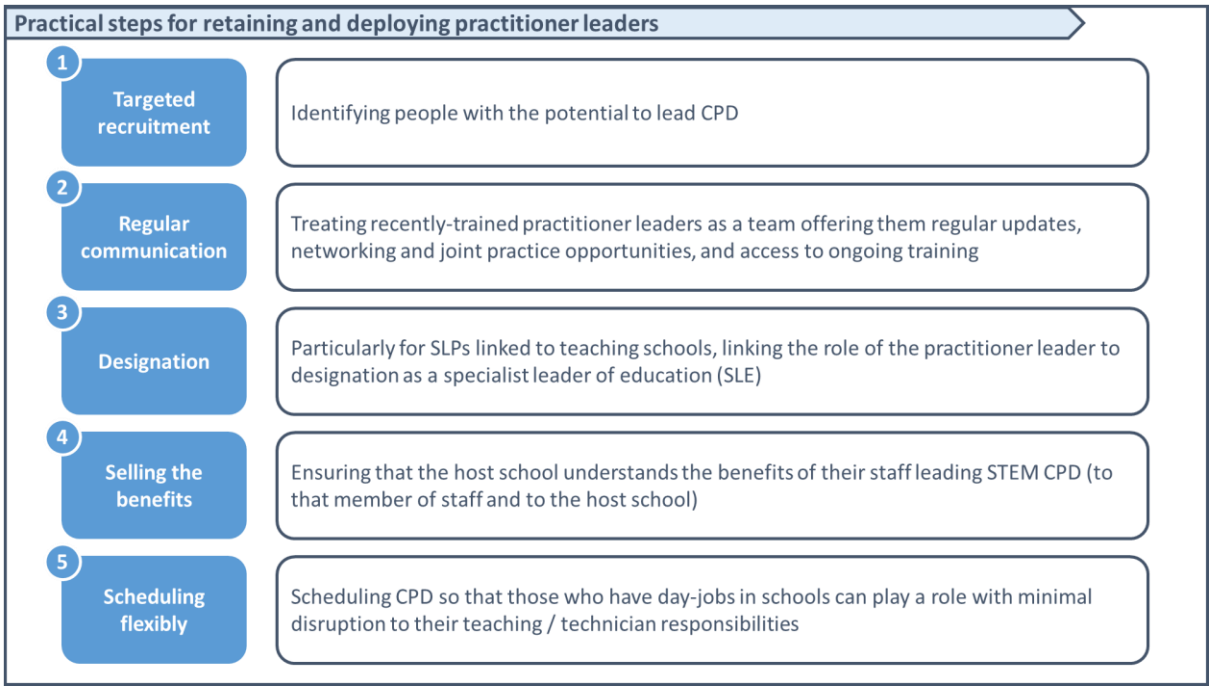
What the survey data also suggests, however, and where it connects to the wide variation in SLPs' estimates of the levels of CPD that were being delivered by practitioner leaders, is that a far smaller proportion of those trained via LEPD were delivering CPD *within the regional Network*. As the chart shows, 1 in 5 (20%) of those who responded to our survey reported that they had delivered CPD within the regional Network. Almost half (46%) had done so in their own schools, and just under one third (30%) had delivered CPD in other partnerships and networks.

We found, furthermore, that 73% of respondents had found out about LEPD via SLPs or national marketing. As such, while their route into the training programme had been through the National STEM Learning Network, they were less likely to have used this training within the Network than within their own schools or partnerships. This may relate to a lack of ongoing communications from the SLPs with prospective practitioner leaders, a lack of clear expectations and a firm commitment about the role those who benefited from the training would play within the regional Network, or a lack of opportunities to lead CPD. Our survey found that only 37% said that they had received communications following their training and only 40% said that they had made any kind of commitment to deliver CPD within the Network – 55% said that they had not made any commitment, and 5% could not say.

On the one hand, it is positive that these teachers and technicians are using their training to improve science teaching and learning. Arguably, whether this is taking place within schools, trusts or other networks, rather than through SLPs, is of less importance. On the other hand, however, this raises a strategic question for the Network about what is expected in return for attending LEPD and whether the way in which LEPD is offered is maximising its contribution to the effectiveness and long-term sustainability of the regional Network.

Where SLPs were having success in retaining and deploying practitioner leaders, there are five practical steps that they have taken. These are set out in figure 15 below.

Figure 15: Five practical steps for retaining and deploying practitioner leaders



Supporting teachers and technicians to lead CPD within the SLP: Holmes Chapel SLP

Holmes Chapel Comprehensive School and Sixth Form College is a teaching school and academy in Cheshire East. The SLP works hard to ensure that their network of practitioner leaders has the skills necessary to support the schools with which they work. Almost two thirds of the CPD they deliver is led by practitioner leaders (current teachers and technicians). There are five key elements to their approach.

a. They begin by making sure that the quality of the LEPD course is sufficiently high.
b. They then recruit participants onto the LEPD course carefully, considering the skills that the SLP needs to deliver their programme, bringing in appropriate expertise where needed.
c. Practitioner leaders are asked to sign a release agreement, which also needs to be signed by their headteacher, committing them to delivering an agreed number of days of CPD over the academic year.
d. In order to keep this network of presenters engaged and motivated, the SLP maintains frequent communications, and brings them together as a group for training and briefing sessions.
e. Presenters are given as much notice as possible of the dates of the CPD they are engaged to deliver as possible, to maximise their chances of being able to deliver them.

Function 3: Recruiting to and delivering CPD

In our previous evaluation, we described that, despite significant increases in the level of CPD the Network delivered from 2013-14 (the year of the transition from RSLCs to SLPs) to 2014-15 (the SLPs' first full year of operation), the consistent challenge reported to us had been recruiting teachers and technicians to CPD activities. This had been the case particularly in relation to traditional-style CPD courses. In the present evaluation, we have found two important shifts.

1. **SLPs had greater clarity about their delivery targets, and were more confident in achieving these**. As levels of CPD have increased, SLPs reported that their targets have become more relevant – they are set at stretching levels, but those that are achievable for mature SLPs. In the previous evaluation, owing to the fact the initial transition was more time-consuming that had been anticipated, many SLPs considered that the level at which the targets were set did not bear sufficient relation to the level of activity the SLPs were able to sustain. In addition, the regional Network has undertaken significant work to improve the flow of data and information, particularly about targets and progress against these. This was reflected in the fact that all of the SLPs lead to whom we spoke had a clear picture of what their targets were and how they were performing against these – this was often not the case during the previous evaluation.

2. **The regional Network is now more confident about delivering the full range of CPD activities, and has built capacity to deliver bespoke STEM CPD**. Due to shifts in the way schools access external CPD, with decreasing demand for traditional-style CPD courses, the importance of being able to offer bespoke CPD within school subject departments, multi-academy trusts and other subject networks was a strong theme in our previous evaluation. In the present evaluation, SLPs have reported that these trends have continued – both the difficulty of recruiting to traditional-style courses, but also greater use of bespoke STEM CPD particularly linked to the use of intensive bursaries and to teaching schools' designation of specialist leaders of education. SLP leads emphasised the importance of developing and capitalising on existing networks of schools as a vital mechanism, both for expanding their reach and sustaining their engagements. SLPs described how they were now creating new networks, taking responsibility for revitalised local subject leader networks, and making links with multi-academy trusts and other schools-led partnerships. Having this capacity to work flexibly and offer tailored CPD for groups of schools working within trusts or through SLPs taking on responsibility for co-ordinating previous subject leader networks shows how the regional Network is moving in step with the way the education system is responding to national policy changes. Continuing to do this, and building local capacity for bespoke CPD will be key to the long-term sustainability of the SLPs and the regional Network as a whole.

As a result, as described in chapter 1, the regional Network has continued to increase the overall levels of CPD it is delivering and the numbers of schools and colleges, teachers and technicians it is reaching. This is an encouraging trend.

Using conferences and local consortia to build local networks around the SLP

Soon after joining the regional Network, **the South Essex Teaching School Alliance** (SETSA) recognised that they needed to establish more of a presence locally and make links with schools who might benefit from their offer of STEM CPD. They ran a launch event for around 70 people, which has now become an annual conference. The conference has become a crucial way in which the SLP generates interest in its CPD programme and gathers contacts from subject leaders in local schools. The conferences are helping the SLP to expand its reach, enabling the SLP to connect with schools with whom it has not previously worked.

Similarly, **Ulverston Victoria SLP** in Cumbria has also used conferences and local consortia to build its networks locally. As local authorities cease to have the capacity to lead subject leader networks, SLPs like Ulverston are filling this gap. At the start of the 2015/16 academic year, they ran a conference in partnership with a local university, providing updates on key STEM developments and then a series of options based on what participants wanted to know more about. They have also reinvigorated local subject leader networks, which now get up to 20-30 attendees each time. Both SETSA and Ulverston SLPs see this form of engagement through networks as crucial to the long-term sustainability of the regional Network.

Another set of challenges we described during the previous evaluation related to some of the central systems that operate across the regional Network. These included programme planning, maintaining a bank of CPD materials (the *professional development experiences or PDEs*) and the central system for booking onto CPD activities. During the present evaluation, there was a wide consensus that these systems had been improved. There was also, however, residual concern that these systems were not working as effectively as they might be. These concerns were raised less vociferously than they had been by members of the regional Network during the previous evaluation.

The main concern voiced during the present evaluation related to the booking system. Network members recognised that this had been improved, and their comments should be seen in this context. Nevertheless, SLP leads remained of the view that the booking system was unwieldy for teachers and technicians seeking to book onto CPD activities. SLP leads continue to perceive that issues with the booking system are resulting in lost bookings, and are reducing the potential reach of the SLPs. It is difficult to corroborate these concerns, since the people who may have been put off from booking onto CPD activities are those who are therefore not known to the Network. Nevertheless, some of the subject leaders in schools that had accessed CPD from the regional Network described that the booking system had proved difficult to navigate and that it was not as smooth and user-friendly as the booking systems for similar CPD providers. Some SLPs, across a range of regional consortia, described how they were working around the central booking system – effectively managing bookings themselves, and then entering the booking information into the system on behalf of those attending CPD. This raises a question about the value of a central booking system. An alternative model might be considered, in which SLPs manage bookings themselves (for example, teaching schools using their existing systems), SLPs self-report data on CPD delivered, and the RDLs play a role ensuring that this is accurate.

Network members also suggested that they would welcome a more collaborative and planned approach to developing the regional Network's CPD programme. They were concerned about the timeliness of programme planning activities, citing some delays in getting the programme finalised, which then had a knock-on effect on their marketing activities ahead of the start of the 2015/16 academic year. They suggested that a more collaborative approach, drawing on the expertise of SLP leads and RDLs, and working to a firm and fixed timetable would be beneficial. Linked to this, newly-

trained practitioner leaders, while positive about the availability of a bank of CPD resources that could be adapted for particular CPD activities, said that they would welcome a similarly collaborative approach to developing these materials. They also suggested it could be made easier to browse through the bank of CPD resources (the *professional development experiences*).

Function 4: Gathering feedback, ensuring quality and impact, and sustaining the Network

Having now made the transition from the RSLC-led regional Network to one led by SLPs, many members to whom we spoke during this evaluation were keen to reflect on the regional Network's long-term sustainability. There are three important reflections that we drew from these conversations.

First, we found that, among SLPs, there is strong focus on the importance of delivering CPD that schools and colleges will pay for. This is an important shift since our previous evaluation, when some SLPs were of the view that they should seek to build connections with local schools by offering some free-to-access CPD as a loss-leader. The shift to greater focus on paid-for CPD reflects strategic decisions taken throughout the regional Network, and a clear recognition that generating income through CPD is crucial to building local delivery capacity and continuing to be able to offer high-quality local STEM CPD. This is a positive sign of the growing maturity of the Network, and augurs well for its long-term sustainability.

Second, as in previous evaluations, members of the regional Network were very positive about the importance of the Impact Toolkit as a mechanism for encouraging strategic and impactful use of CPD. In our previous evaluation, while Network leaders understood the value of the Impact Toolkit, among subject leaders who had accessed CPD from the regional Network we found that there was less confidence in being able to identify evidence of impact on teaching and learning from STEM CPD. As a result, members of the Network have sought to reinforce messages about strategic planning and evaluation of the impact of CPD.

During the present evaluation, we found that these messages were becoming more embedded, with wider recognition of how to identify evidence that CPD was making a difference to teaching / technician practices, and improving pupils' learning. There were, however, a significant minority of 'cannot say' responses to questions about impact in our survey of teachers and technicians who had accessed CPD from the regional Network. The figures ranged from very small percentages responding 'cannot say' in relation to questions about impact on CPD participants, to between one fifth and one third in relation to some questions about impact on pupils. In some instances, this may have related to the timing of the survey – respondents may have responded 'cannot say' as the impact had not been seen yet. This does suggest, however, that there is still further to go to embed fully the Impact Toolkit approach.

Embedding the Impact Toolkit approach will be helped by the fact that SLPs are now getting access to Impact Toolkit data. Ensuring the regular flow of feedback and evidence of impact from CPD participants is crucial in enabling SLPs to refine their CPD offer and develop their future plans. Early in the present evaluation, some members of the Network raised concerns raised about whether all SLPs had access to this data and the format in which this was provided (in some instances, in hard-copy or pdfs, which creates additional administrative work for SLPs). This may have changed with the Impact Toolkit moving online.

In this context, it will also be important to monitor closely the effect of reducing the Impact Awards – previously, access to an Impact Award, which effectively re-paid schools a proportion of the cost of a CPD activity, depended on completing the Impact Toolkit forms. Without this requirement, it will be important to monitor whether the regional Network continues to receive the data and feedback about the impact of its CPD activities.

The third and final point we wish to make here regarding sustainability relates to the way in which the regional Network as a whole manages risk and plans for contingencies. In particular, some SLP leads and RDLs suggested that there needed to be more concrete arrangements in place to mitigate risks that a particular SLP lead or another key member of staff, such as the administrative lead, moves to another role or is away from their SLP role for a significant period of time due to sickness. The concern was that these issues should not leave certain areas of the county without access to local STEM CPD. As noted in the preceding section on the role of the SLPs, while we know that some SLPs have developed broad coalitions to lead their partnerships, others are more dependent on the expertise of the individual lead. There have been a small number of instances recounted to us where the SLP lead has not been available or has changed role, and there has not been the capacity within the partnership to cover their role and sustain the work of the SLP. This risk is inherent in local, school-based models, but it does also suggest that there is an important role for regional contingency planning and, potentially, more joint working across multiple SLPs to mitigate these risks.

Conclusion

Between the summer of 2013 and the spring of 2016, the regional Network has been at the intersection of two profound transformations. First, the Network itself was re-designed, with a shift from regional versions of the National Science Learning Centre (the RSLCs) to a new model in which schools-led partnerships would be established and would take over responsibility for delivering the Network's regional programme. Second, this took place at a time of significant transition within the education system as a whole, with changes to school structures, curriculum, assessment, accountability and funding all shaping the way in which schools sought to engage in external, subject-specific CPD. Members of the regional Network have reflected that the scale of the transition and the work required to make the change from one type of delivery model to another was under-estimated, and this had a knock-on effect on the level of delivery in 2013-14.

As we reflected in our previous evaluation, the most significant achievement of the regional Network during this period is that it has sustained itself, re-built its reputation and presence locally, increased its capacity and levels of delivery, all the while sustaining high levels of quality and impact. The present evaluation has shown that the regional Network has continued, in 2015-16, to increase the levels of CPD it is delivering, reaching levels comparable with those of the RSLCs. SLPs are increasing their reach, forging new connections among the ever-growing variety of school and college partnerships, while at the same time strengthening their engagement with key partners and supporting them to take a more strategic approach to engaging in STEM CPD. Levels of impact reported by CPD participants remain strong, especially by comparison to other countries – for example, over nine in 10 participants in regional Network CPD reported impact on their knowledge, skills and practice, compared to levels closer to half or two-thirds in the most recent teaching and learning international survey.

The credit for these achievements rests with members of the regional Network, particularly those working within and with SLPs. The figures and trends we have described in chapters 1 and 2 reflect the amount of hard work these members of the Network have invested in pro-actively engaging local schools and colleges, and planning and tailoring CPD to fit their requirements. They also reflect, however, the way in which the regional Network, during this transitional period, has sought out formative feedback through formal evaluation and informal intelligence-gathering, and has used this to make changes and disseminate key characteristics of effective practice. This has been notable in the present evaluation, for example in terms of the shift among many SLPs towards more bespoke models of CPD delivery and embedding skills in monitoring the impact of CPD.

There remain areas of challenge, however. Most notably, these include ensuring the SLPs have sufficient capacity within their partnerships and among practitioner leaders, and ensuring the central systems support them to do this (rather than creating additional administration for them to manage). As noted at the end of chapter 3, changes to the Impact Award funding will need to be monitored carefully to assess the impact this has on take-up of CPD and completion of Impact Toolkit evaluation forms.

During the period from 2013 to 2016, three different organisations played the role of Regional Operator within the regional Network – STEM Learning, the University of Hertfordshire, and Sheffield Hallam University. This has allowed different approaches to be trialled and tested in the five regional consortia, and has resulted in valuable learning about what has worked well in the new regional arrangements. Since 1 April 2016, the five regional consortia have been brought under a single model, led by STEM Learning, which will provide an opportunity to ensure consistency in core approaches, such as around setting expectations of practitioner leaders, where greater consistency and clarity will

help the SLPs to fulfil their core purpose. We recognise that the future of the regional Network after the end of the 2015/16 academic year is yet to be determined, with the contract for the regional Network out for tender at the time of writing. Whatever the outcomes of that process are, as the regional Network starts the 2016/17 academic year, there will need to be a focus on how it can build on the achievements of the period from 2013 to 2016. Our evaluation has suggested three main themes to consider in the next stage of the Network's development.

Theme 1: Communications and marketing

We suggest this theme because, while SLPs report progress in establishing their brand and presence locally, they consider that there is further to go to ensure there is widespread awareness of the regional Network, the SLPs, and how schools and colleges can access their support. Members of the Network suggested two things that would help to improve this. First, more ongoing national communications from the National STEM Learning Network, planned and co-ordinated with regional consortia, and continuing to make explicit the role of SLPs within the Network. Second, ongoing central support either at national or regional level with communications and practical matters, such as maintaining an up-to-date list of subject leader contacts.

Theme 2: Local capacity to lead STEM CPD

SLPs play a crucial and multi-faceted role within the regional Network. Working with the RDLs, they have responsibility for engaging local schools, planning CPD activities, brokering partnerships, training and deploying practitioner leaders, and monitoring delivery and impact, at the same time as sustaining their partnership. Most of those involved in the day-to-day work of SLPs do so in addition to other responsibilities, usually a significant teaching and/or subject leadership commitment. SLPs we have engaged through both of our evaluations have described the significant administrative aspect of the role. Of course, central systems can always be a target for dissatisfaction, and we recognise that there will always be an element of administration that is necessary – indeed essential – to the smooth running of national CPD delivery network. Nevertheless, the challenge for the regional Network in the next phase of its development is to minimise the administrative requirements on SLPs and to enable them to build their capacity to deliver STEM CPD.

Members of the Network suggested three things related to this theme that would help the regional Network to develop. First, they suggested that greater thought could be given to how best to enable SLP-to-SLP collaboration. This is not to say that there are significant *obstacles* to this at present, but rather to recognise the value of *facilitating* and *encouraging* these forms of collaboration. For instance, having RDLs working with multiple SLPs will provide a means of channelling collaborative endeavours, and ensuring the booking and funding system can take account of joint CPD offers.

Second, Network members suggested that there would be value in continuing to set out clearly and consistently across the Network the expectations of SLPs. They suggested this both in terms of core roles of SLP lead, partners and administrative support, and to avoid additional responsibilities being given to the SLPs without consideration of how the capacity will be created to fulfil these.

Third, the move to a single organisation fulfilling the regional operator role offers an opportunity to ensure that there are consistent systems, policies and processes across the Network – where such consistency adds value. These include giving consideration to the policy on free places in exchange for schools hosting CPD, on models of funding SLPs, and of the way in which booking and programme planning are best carried out across the Network.

Theme 3: Local capacity to deliver STEM CPD

As we described in chapter 3, while the regional Network has been successful in training teachers and technicians to deliver STEM CPD, via the LEPD course, our evidence suggests that there is wide variation in the extent to which SLPs have been able to deploy practitioner leaders to lead CPD. We know that this reflects, in part, difficulties matching CPD activities to the timetables of serving teachers and technicians, complicated by the reluctance of school leaders to allow staff to be out of the classroom during teaching time. Nevertheless, our evaluation has identified practical steps that some SLPs are taking to overcome these challenges and to maximise the benefits of current teachers and technicians leading STEM CPD for their peers. These practical steps include targeted recruitment of individuals with the potential to be CPD leaders, regular communications and clear, consistent expectations of how those benefitting from the LEPD training will use these skills within the regional Network, as well as their own schools or trusts. Looking ahead, members of the Network have suggested that a mixed model is likely to be most effective – being able to draw on external consultants for particular forms of CPD and practitioner leaders for others. They would welcome support in doing so, specifically through creating a central database of CPD facilitators who operate within the Network, made up of both external CPD consultants and practitioner leaders.

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Our two evaluations, 2013-15 and 2015-16, have shown the transition the regional Network has made from one delivery model to a schools-led partnership approach to delivering STEM CPD nationally. Lessons have been drawn from the initial experience of the transition itself, many of which have been reflected on and embedded within the day-to-day operation of the Network. During this time, the regional Network has achieved year-on-year increases in the level of CPD it is delivering while at the same time maintaining high levels of quality and impact. These are significant achievements. In this concluding chapter, we have identified three sets of suggestions, based the feedback we heard from Network members, as to how the Network can continue to development to expand its reach and maximise its impact. We hope that this evaluation contributes to achieving these aims.