



Network

Evaluation of the
National Network
of Science
Learning Centres:
Final Report

January 2008

Evaluation of the National Network of Science Learning Centres

The Wellcome Trust and the Department for Children, Schools and Families

A final report submitted by GHK

in association with

People Science & Policy Ltd, Edcon Ltd and TNS Social Research

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EXECUTIVE SUMMARY

1 Introduction and Evaluation Approach

This report presents the findings of the Evaluation of the National Network of Science Learning Centres (SLCs). The evaluation was commissioned by the Department for Children, Schools and Families (DCSF) and the Wellcome Trust, and undertaken by a consortium led by GHK Consulting in collaboration with Edcon Ltd, People Science & Policy Ltd and TNS Social Research between May 2006 and December 2007.

The aim of the evaluation was to assess and report on the progress of the SLC initiative against its short and medium term objectives. The study explored:

- The impact of the initiative on science educators¹ and their pupils/students;
- Its impact on the culture of continuing professional development (CPD); and
- The operation of the Network – in terms of effectiveness/contribution to impacts.

The evaluation consisted of four separate 'Components', each comprising a series of tasks as summarised below.

- **Component A: Scoping/Initial Evaluation Study** (May to September 2006) – including visits to each Regional Centre and the National Centre, interviews with staff, regional partners and educators, and interviews with 26 national stakeholders.
- **Component B: Initial Survey of Science Educators** (July to December 2006) – including a telephone survey of 1,400 educators, and telephone interviews with 100 educators yet to receive SLC provision.
- **Component C: Educational Impact Study** (June 2006 to July 2007) – featuring the observation of 22 SLC courses, and follow-up contacts with participants and schools to identify impact.
- **Component D: Early Impact Study** (September to December 2007) – including a survey of 5,000 educators using SLC services (the Early Impact Survey), return visits to the Centres, and follow-up interviews with national stakeholders.

Individual reports were produced for each study Component, which were consolidated in an Interim report (submitted in September 2006) and the final report.

2 The Science Learning Centre Initiative

The aims of the SLC initiative are multi-layered, ultimately to ensure that pupils experience a science education that equips them for their future lives and promotes a continued interest in science for further study or as a career option. The vision for the initiative is for science education to inspire pupils by providing exciting, intellectually stimulating and relevant experiences. This long term aim is supported by a series of

¹ Throughout the study the term 'science educator' has been used to include: heads of science, science teachers and technicians in Secondary schools and sixth form colleges/FE; science coordinators, teachers and assistants in Primary schools; and teachers and assistants in special schools and pupil referral units.

short and medium term aims, including enhancing educators' professional skills by introducing contemporary scientific ideas, providing training in effective teaching approaches and offering experience of modern scientific techniques.

The initiative is underpinned by two key principles – first that the SLC Network is greater than the sum of its parts, and second that it offers educators continued access to high quality professional development services rather than discrete courses. However, this form of CPD demands the commitment of educators and their employers, and represents a cultural change for many. Changing CPD culture is likely to be the greatest challenge for the initiative, with key issues including:

- Limited teacher exposure to science-specific CPD on a systematic basis to meet their individual development needs;
- The adequacy of school-based appraisal systems for assessing teacher performance and identifying development needs;
- Difficulties for teachers in identifying and accessing suitable CPD services; and
- The financial and time constraints which militate against participation in such professional development activities.

3 The Regional and National Centres

The initiative is delivered through a Network of nine Regional Centres and the National Science Learning Centre (NSLC) at York. The Regional Centres and the NSLC display considerable differences in terms of funding, structures and delivery models. The Regional Centres are funded by DCSF and the NSLC by the Wellcome Trust, and were established as independent entities which have come together as a Network.

3.1 The National Science Learning Centre (NSLC)

The NSLC is housed on the science campus at the University of York, with on-site facilities that allow provision to have a residential component. The NSLC focuses on providing multi-day courses with on-site accommodation, to which it recruits on a national basis, and commonly uses Impact Rewards and bursaries to subsidise educator attendance. With over 20 FTE staff, the Centre also acts as a 'hub' for the Regional Centres, including providing national-level marketing, managing the SLC portal and providing a resource centre for the Regional Centres.

3.2 The Regional Centres

The Regional Centres were given a considerable degree of freedom to develop their structures, partnerships and service offers. Seven are located within Higher Education Institutions (HEIs), with one in a science centre and another in a specially built building. All received funding to develop or modify premises for classroom and practical sessions, including up-to-date laboratory and IT facilities. The Regional Centres have extended their reach by delivering services on an outreach basis, using a range of off-site delivery options including specially equipped 'mini-Centres' and partner or school/college premises.

The Regional Centres are underpinned by 'core' partnerships commonly featuring HEIs, which act as lead partners in all but two cases. Other core partners include: representatives of SETPOINTS and the Association for Science Education (ASE),

providers of science CPD, Local Authorities and other organisations with a science focus – such as research facilities, museums and science and technology focused companies. The Regional Centres have also established partnerships and collaborative arrangements with a range of regional and national organisations – often focused on service delivery and course development.

The Regional Centres differ considerably from the NSLC in terms of their:

- Staffing – each Regional Centre had fewer than 10 FTE staff, in some cases considerably fewer, compared to the 20 plus FTEs at the NSLC.
- Delivery models – with the Regional Centres providing mainly single day courses, compared to the multi-day, residential courses at the NSLC.

The delivery models followed by the Regional Centres share many similarities, which in addition to delivering outreach services were also characterised by the balance between internal and external delivery, and balance between 'core' programme and more 'bespoke' provision.

3.3 Progress and Achievements

The early stages of the evaluation identified how the National and Regional Centres were moving from a 'development' to a 'consolidation' phase – having established themselves, recruited staff and delivered their first programmes of provision. A series of challenges facing the Centres were also identified, including:

- Having to raise awareness and establish themselves as key providers of science CPD – which often required greater effort than was initially anticipated;
- Stimulating demand for science-specific CPD – in the context of competition for school budgets and teacher time, and other barriers to participation – and extending market penetration and educator participation;
- Establishing effective working relationships with key partners, stakeholders and providers – addressing concerns over competition and service duplication, and embedding the Centres in the regional and national CPD infrastructure; and
- Achieving financial sustainability – by increasing educator participation and market penetration, while retaining the SLC mission of providing longitudinal CPD and cutting edge services.

Early indications of the quality and appropriateness of SLC services were positive, with high levels of customer satisfaction being reported and the Interim report concluding that the elements were in place to provide positive impacts for educators. The latter stages of the study explored provision quality in more depth through the observation of a sample of SLC provision, and found that the courses observed exemplified good practice in teaching and learning.

In the 2006/7 year the Centres described making few major changes to their staffing structures and operational models, although in some cases they had reviewed their strategic aims and purposes on the basis of their initial experience. Some of the Centres reported how the involvement of individuals with specialisms in the Primary, Secondary and Post-16 sectors had been helpful, including helping break into markets which had remained closed previously.

Despite facing challenges initially at least, the Regional Centres had made good progress in establishing regional and local partnerships and collaborative arrangements, and in so doing helped counter concerns over competition and duplication. Local Authority relationships emerged as particularly important – especially with science advisors and Secondary National Strategy consultants – and a variety of collaborative activities were identified including joint service delivery, sign-posting provision and recruiting Local Authority staff to advisory groups. It was recognised that, even where Centres had been particularly active, work remains to be done to establish good relations across all regions and Authorities.

Performance in 2006/7 was also positive, with all the Centres exceeding their targets for educator throughput, delivering over 13,000 educator days, and also offering a range of events and conferences for science educators. However, high levels of course cancellation continued to be reported across the Network, with some Centres reporting cancellation rates of 50% or above.

Finally, questions were raised over the extent to which the SLC portal is being used to its full potential. The portal functions range from on-line course booking to supporting CPD by linking discrete pieces of provision, and although its use by the Centres had increased over the study period, it was still not commonly used, for example, to provide performance reports across the Network. At the same time, portal use by educators using SLC services was limited, with a series of access and functionality issues being reported. Questions remain over whether portals can add value to CPD provision, and if so how this can be achieved.

4 The SLC Network

As well as being established as independent Centres, the evaluation also identified a series of initial tensions influencing the SLCs' ability to work collaboratively. These included an emphasis on throughput targets, concerns over competition, difficulties in delivering courses across the Centres and the inability to share management information. However, the latter stages of the evaluation found that considerable progress had been made to establish a formalised 'Network', based on the realisation of the benefits of collaborative activity and the development of a Network strategy.

The Network has clarified its aims and objectives, and the means by which they will be achieved, through the development of a Network strategy. The aim of the strategy is to *"Improve the quality of science teaching and learning through effective continuing professional development for all those involved in science education"*, which is supported by four strategic objectives:

1. To supply effective, high quality CPD to increase science educators' awareness, understanding and confidence by updating their subject knowledge, pedagogical skills and appreciation of careers from science;
2. To stimulate demand for CPD and embed it as an intrinsic and ongoing part of science educators' professional life;
3. To work strategically with partners in the science education community to coordinate and improve access to CPD at the regional and national levels; and

4. To establish Network cohesion, coordination and direction to operate efficiently and effectively.

The Network also has an Operational Plan, featuring a series of operational objectives showing how it will contribute to delivery across all four strategic objectives.

Key components of the Network structure include:

- **The Network Project Director** – this post was created as a 12 month secondment to support Network development, and as a central coordinating point for contacts with external partners and stakeholders.
- **The Directors' Group** – this group meets monthly and coordinates policy and practice across the Network. It also retains overall responsibility for ensuring the Network quality assurance system is being followed, and agrees an annual action plan of activities to be taken forward across a series of working groups.
- **Network working groups** – there are currently six working groups, which were reviewed following the recommendations of the Interim report, namely: the Primary Development Group, the Secondary Development Group, the Post 16 Development Group, the Communications Working Group, the Learning and Technology Group and the Impact and Research Group. The working groups comprise SLC staff and are usually chaired at Director level, and are tasked to take forward specific actions to implement an annual action plan on a 'task and finish' basis.

The achievements of the Network in 2006/7 included an increased level of collaborative activity both between the individual Centres and with external partners, the increased exchange of good practice and the joint development of provision. This included bidding and delivering a series of national CPD projects, with a value of over £1.8 million, for funders including DCSF, the Royal Society of Chemistry and others.

Each Centre participates in the Network through attendance at meetings, working groups, collaborative activities and Network projects. Benefits from their participation included enhanced profile and credibility, the provision of a 'strategic voice' for lobbying and consultation, and the provision of peer support and the exchange of ideas and good practice. While commitment to the Network was high across the Centres, some faced challenges in finding the time to contribute to the level they would have liked.

The national stakeholders interviewed also considered that the Network was becoming more recognisable as an entity, and in many cases was now easier to engage with. However, as the following section describes, more remains to be done before the Network is viewed externally as a coherent and consistent whole.

5 The National Stakeholder Perspective

A series of 26 national stakeholders were interviewed at the start and end of the study, to explore their perceptions of the SLCs, the level and nature of engagement with them, and any change in these over time. The stakeholders represented a range of organisations, either from the education world with responsibility for CPD (where science was one subject amongst many) or the scientific world (where science education was one subject amongst many).

The first interviews identified a range of opinions of the initiative, which while broadly supportive included more negative views amongst the educational representatives, some of whom felt they had been excluded from the initiative. The second interviews were more positive, largely due to positive feedback from teachers on the quality of SLC provision and the Government's commitment to the initiative, although some negative views were still expressed.

Individuals working on Government education initiatives described developing ways to work with the Centres, although some were less positive, largely as they feel the out-of-school model of provision is not the most effective. This issue was identified in the first interviews, although concerns had diminished as the stakeholders became aware of the Centres' outreach activities and the inclusion of longitudinal components in their provision. The professional bodies remained supportive of the initiative, despite some having practical difficulties engaging with the ten different Centres. There was also the view that the Regional Centres were continuing to look for a role, were yet to position themselves in the regional CPD infrastructure, and needed to do more to link with Local Authorities and the Secondary National Strategy.

From the stakeholder perspective, the formalisation of the Network and the Network Project Director post had had a considerable impact on their relations with the initiative. The provision of a single contact point was highly valued, although others noted that some courses are still not available nation-wide. Indeed, provision was not seen as being consistently available across the country, and that a common course offer with a degree of local variation was required.

Views on the quality and appropriateness of SLC services were positive, based largely on reports from participating educators, although concerns continued to be raised over perceived variations in service quality across the Network. The second interviews also found fewer concerns over competition at the national level, and more of an acceptance that the SLCs are here to stay and any conflicts must be worked through. Stakeholders were, however, unclear about the course development process in particular, leading some to consider that the process is ad hoc and not well planned. The levels of SLC course cancellation were also raised, and influenced some stakeholders' views of the planning of provision.

6 The Impact of the SLC Initiative

One of the key aims of the study was to identify the extent to which the SLC initiative was beginning to have an impact on educators, pupils and students, and schools and colleges. The evaluation concluded that the SLCs are having positive impacts on all three areas, and identified a series of key factors which influence their achievement.

Evidence of impact was drawn mainly from three sources – examples cited by the Centres, the findings from the Early Impact Survey, and the results of the Educational Impact Study. Most Centres could only provide anecdotal examples, and while some had evaluated individual pieces of provision none had attempted to assess their impact more widely. While there are plans for a common approach to impact assessment across the Network, the Centres considered that their high levels of customer satisfaction and repeat business meant their services were having positive effects.

The Early Impact Survey and Educational Impact Study respectively provided a quantitative and a more qualitative, judgement-based insight into the impact of the Centres. Their findings suggest that:

- **Impacts on individual educators** were the most commonly identified impacts, with most respondents to the Early Impact Survey reporting impacts on their:
 - Personal motivation – reported by over eight out of ten educators overall;
 - Subject knowledge – reported by almost eight out of ten educators; and
 - Confidence in the classroom – reported by almost six out of ten educators.

The Educational Impact Study featured the observation of provision and follow-up with participating educators, allowing impacts to be explored in detail. Here gains in personal knowledge and skills represented '*first stage*' impacts, which while valuable may not be sustained in the long term. '*Second stage*' impacts on pedagogy, management and leadership capabilities, and on longer term professional development, were also identified. In these cases courses with a longitudinal component were more likely to impact than single day provision.

- **Impacts in the classroom and on pupils** were reported by four out of five and three out of four respondents to the Early Impact Survey respectively. The impacts resulted from access to more engaging teaching resources, new ideas for lessons and practical sessions – with the provision of materials for use in the classroom being highly valued. The Educational Impact Study also provided examples of classroom impacts, including '*second stage*' impacts on pedagogy which were likely to have a longer term influence.
- **Impacts on schools and other educators** were reported less frequently, although two thirds of respondents to the Early Impact Survey reported impact on their schools overall and over half reported specific impacts on colleagues, whole school objectives and school development plans.

Many respondents to the Early Impact Survey also considered that further impacts were likely to result from their SLC involvement, but that these would take time to be realised. There is an important role for the Centres to play in ensuring that potential benefits are achieved, through the provision of continued support to embed change.

Impacting on the wider **culture of science CPD** remains a challenge for the Centres, although some positive change was suggested. At the regional level examples were offered by the Centres and their partners of the increased take-up of CPD by individual schools, suggesting some positive change from the 'bottom up'. Similarly, the increased willingness of regional partners and stakeholders to engage with the initiative may also suggest a positive cultural shift. The national stakeholder interviews also suggested the beginnings of a shift in views on the importance of science-specific CPD, and the increased acceptance of and engagement with the SLC initiative. However the question remains over whether the Centres are working with a sufficient number of schools and colleges to influence CPD culture more widely.

A series of factors were identified which influenced the likelihood of positive impacts from SLC provision, including:

- A strong longitudinal component to provision – either through multiple or linked days of provision, or a wrap-round model featuring pre- and post-course tasks;

- The identification of expected learning outcomes in advance of attending provision – and acting on this information to tailor provision as practicable;
- The use of pre- and post-course activities – and the completion of any preparatory work prior to course attendance; and
- Post-course follow-up by the Centres.

Many of these factors were part of the delivery models followed by the Centres, although they were not applied on a consistent basis across the Network.

7 Conclusions and Recommendations

7.1 Conclusions

The evaluation concluded that good progress has been made towards the short and medium term aims of the SLC initiative, with the Regional and National Centres making a positive contribution to the professional skills of science educators which are impacting on pupils' classroom experiences and learning. Particular achievements in the first two full academic years of operation include:

- Establishing the Centres as operational entities – including setting up premises, administrative systems and recruiting staff.
- Raising awareness of the initiative and the individual Centres regionally and nationally – increasingly through recommendations from service users.
- Establishing the SLC Network – moving from ten independent Centres to a Network characterised by high levels of commitment and collaboration.
- Delivering high quality CPD services with the potential for impact – with each Centre exceeding their throughput targets in 2006/7.
- Establishing positive relationships with regional and national stakeholders – leading to a range of regional and national collaborative working arrangements.

The study concluded that the development of partnership and collaborative arrangements at the national and regional levels represent the way forward for the Network, supported by a clear and shared view of the Centres' strategic purpose and uniqueness compared to other providers.

The Impact of the Initiative

The study found that the Centres are having positive impacts on the educators they work with, their colleagues in schools and colleges and the pupils they teach. Although these impacts cannot yet be quantified across the Network, the Early Impact Survey and Educational Impact Study identified impact was being achieved:

- **For individual educators** – including improved motivation, subject knowledge and confidence in the classroom; and higher level impacts on pedagogy, management and leadership capabilities.
- **In the classroom and on pupils** – including impacts on pupils' learning, interest, motivation and achievement, and impacts on pedagogy which were likely to have a longer term influence.

- **For schools and other educators** – although reported less frequently, impacts were reported on participating schools overall, and more specifically on colleagues, whole school objectives and school development plans.

Impacts on the **culture of science-specific CPD** were less easy to gauge, although the fieldwork and national stakeholder interviews suggested some positive developments at the regional and national levels. This area of impact remains the greatest challenge for the SLCs, and one they are unlikely to address in isolation.

The educators also commonly considered that further impacts were likely to result from their involvement with the Centres, but that these would take time to be realised. The challenge for the Network is to extend their influence by scaling up delivery, and taking further steps to ensure impacts result for participating educators and schools.

The Operation of the Network

The development of the SLC Network and the Network strategy represent major successes and provide a solid platform for further development. While early days in implementation, the strategy presents an opportunity to address outstanding operational issues, develop common approaches and allow the Centres to speak with a single voice.

The evaluation found that the Centres are becoming recognised as providers of high quality CPD, which was confirmed through the observation of sessions and the views and experiences of partners, stakeholders and participants. Satisfaction with SLC services is very high, and provision is commonly seen as being better or at least as good as previous experiences.

While no single model of provision was found to be inherently better than another in the context of their different objectives and intended learning outcomes, the inclusion of a longitudinal component was found to increase the likelihood of impact. While the Regional and National Centres' delivery models featured provision of different durations, the Regional Centres increasingly offered single day courses, including pre- and post-course activities. However, these and other approaches to maximising impact were not used on a consistent basis across the Network. Other areas where common and consistent approaches would be beneficial include the SLC portal, the collection and reporting of management information and the assessment of impact.

7.2 Recommendations

The recommendations focus on the further development and success of the initiative, and include:

Strategic Recommendations/Recommendations for Funders and Policy Makers

- Build on successes in integrating SLC services with other local, regional and national partners, strategies and approaches – for example the successful relationships between some SLCs and local Secondary National Strategy staff.
- Emphasise the role of the SLCs in supporting change in the culture of CPD generally in schools and influencing the demand side. Seek to secure ring-fenced CPD budgets for schools.

- Establish a research and analysis team at the NSLC, to provide a central research capacity to support the implementation of Network strategy. The main function of this team would be to explore supply and demand issues to inform programme planning, and future SLC strategy, nationally and regionally.
- Based on the work of the research and analysis team, the Centres with their national, regional and local partners should identify a minimum CPD requirement for all science teachers.
- As part of the implementation of the Network strategy, establish a set of key performance indicators (KPIs) which encapsulate the objectives of the initiative and can be collected, analysed and reported through the portal.
- Implement a common approach to assessing impact across the Network, using the Impact Framework while recognising its limitations.

For the SLC Network

- Make the Network Project Director post permanent, and create new posts to support bidding for Network projects and coordinating their delivery.
- Explore the options for continuing and formalising the roles of the current Primary, Secondary and Post-16 'sector leads'.
- Map provision against the minimum science CPD requirement at the regional and local levels, working with partners to identify gaps and areas of demand. Based on this establish registers of provision, to allow the Centres to provide a comprehensive referral function for science CPD.
- Extend the longitudinal elements of SLC provision as appropriate to the objectives and intended outcomes of individual courses – including using pre- and post-course materials to facilitate impact, and offering linked or suites of provision to promote a more continuous approach to CPD.
- Continue and extend efforts to engage a broader range of local, regional and national stakeholders with the Network and SLC initiative more broadly, ensuring capacity is in place to do so effectively.
- The funders should commission an independent, external review of the SLC portal to establish the requirements of the Centres and how these can be addressed. Following this, the Network should take steps to ensure that the portal is used on a more consistent basis.

1 INTRODUCTION

This is the draft final report of the Evaluation of the National Network of Science Learning Centres (SLCs), undertaken by a consortium led by GHK Consulting in collaboration with Edcon Ltd, People Science & Policy Ltd and TNS Social Research. The report is the product of an 18 month evaluation programme, comprising a series of specific activities to explore and report on progress with the Science Learning Centre initiative across four domains of influence, in terms of:

- SLC impacts on school science educators²;
- SLC impacts on pupils and students;
- SLC impacts on the culture, expectation and uptake of continuing professional development; and
- The operation of the SLC Network – in terms of effectiveness of processes and contribution to impacts.

1.1 Aims and Objectives of the Evaluation

The aims of the SLC initiative are multi-layered, with its long term aim being to ensure that students and pupils experience a science education that equips them for their future lives, and promotes a continued interest in science as an area for further study or as a future career option. The vision underpinning the initiative is that science education should inspire pupils by providing them with exciting, intellectually stimulating and relevant experiences.

The short and medium term aims that support this long term aim form the focus of this evaluation, which centres on science educators and the environment in which they operate. The initiative aims to help enhance the professional skills of science educators by:

- Introducing contemporary scientific ideas;
- Providing training in effective teaching approaches; and
- Offering experience of modern scientific techniques.

These short to medium term aims were mapped in the invitation to tender for the study against four key evaluation elements, namely the:

- Operation of the SLC Network – in terms of effectiveness and contribution to impacts;
- Impact on school science educators;
- Impact on pupils and students; and
- Impact on the culture, expectation and uptake of continuing professional development (CPD).

² Throughout the study the term 'science educator' has been used to include: heads of science, science teachers and technicians in Secondary schools and sixth form colleges/FE; science coordinators, teachers and assistants in Primary schools; and teachers and assistants in special schools and pupil referral units.

1.2 Methodological Overview

The methodology employed for the study featured four separate Components, each comprising a series of specific tasks, which are summarised below:

- **Component A – Scoping and Initial Evaluation Study (May to September 2006)** – featuring a series of scoping and initial evaluative activities including:
 - Desk research to review SLC documentation and recent research of relevance to the SLC initiative.
 - Initial visits to each of the nine Regional Centres and the National Centre, featuring consultations with SLC staff, delivery and strategic partners and local and regional stakeholders. This task also included telephone interviews with 32 educators using SLC services.
 - Consultations with a range of national stakeholders – to explore their perceptions of and engagement with the initiative, to act as a ‘baseline’ for the follow-up interviews under Component D.
- **Component B – Initial Survey of Science Educators/Interviews with Educators Not Using SLC Services (July to December 2006)** – featuring:
 - An initial telephone survey of 1,400 educators – to explore their attitudes towards and experience of science-specific CPD, and providing a baseline for future evaluation studies.
 - Telephone interviews with 100 educators showing an interest in the SLC Network but yet to receive provision – to identify their reasons for non-participation to date.
- **Component C – Educational Impact Study (June 2006 to July 2007)** – featuring the longitudinal tracking of SLC service use to changes in classroom practice, through the observation of a sample of SLC provision and follow-up visits to schools and colleges.
- **Component D – Early Impact Study (September to December 2007)** – featuring:
 - Second visits to the Regional and National Centres – including interviews with Centre staff, and a range of local/regional partners and stakeholders.
 - Follow-up interviews with the national stakeholders – to explore any changes in perception and engagement since the initial interviews.
 - The Early Impact Survey – a postal survey of 5,000 educators to explore their experiences of and satisfaction with SLC services, and the impacts resulting from them. This task also included follow-up telephone interviews with 63 respondents, to explore their experiences in more detail.

Reports have been produced for the key study tasks, which are available separately from this document. This report builds on the findings of the Interim report produced in September 2006, with a particular focus on Components C and D of the methodology.

1.3 Report Structure

The report is structured as follows:

- Chapter 2 – provides background and contextual information on the SLC initiative and summarises the findings from the Interim report.
- Chapter 3 – reviews the progress of the individual Centres in terms of their key processes and structures.
- Chapter 4 – reviews the development and increased formalisation of the SLC Network, including its successes and challenges for the future.
- Chapter 5 – reports on the update interviews with national stakeholders, to explore any changes in their perception or engagement.
- Chapter 6 – provides the findings of the study on the impact of the initiative to date – focusing on the quantitative Early Impact Survey and observational Educational Impact Study.

The report also contains two annexes:

- Annex I describes the study methodology in more detail.
- Annex II provides a listing of the organisations interviewed in the follow-up stakeholder interviews.

2 THE SCIENCE LEARNING CENTRE INITIATIVE

2.1 Introduction

This Chapter provides a brief overview of the Science Learning Centre initiative, its aims and objectives, rationale and context, and delivery structures. The key findings of the first stages of the study, as encapsulated in the Interim report, are also summarised to provide the context for the later stages of the study upon which this report focuses.

2.2 Background and Context

The Science Learning Centre initiative is funded jointly by the Department for Children, Schools and Families (DCSF) and the Wellcome Trust, with the common vision to:

“Bring exciting contemporary science into the classroom, and to enable teachers to refresh and extend their skills, so that young people gain the knowledge and understanding they need – both as citizens and scientists of the future.”

The initiative is delivered through the National Science Learning Centre (NSLC) based at the University of York, which is funded by the Wellcome Trust until 2013, and nine Regional Centres funded by DCSF. The National Centre is expected to receive up to £25 million funding to 2013, and the nine Regional Centres £26 million to 2008.

The aims of the initiative are multi-layered. The long term aim is to ensure that students and pupils experience a science education that equips them for their future lives, and promotes continued interest in science as an area for further study and potential career options. The short and medium term aims are to help science educators enhance their professional skills by:

- Introducing contemporary scientific ideas;
- Providing training in effective teaching approaches; and
- Offering experience of modern scientific techniques.

From the outset, the initiative was underpinned by two fundamental principles – firstly that it offers educators genuine CPD opportunities, and secondly that the SLC Network is greater than the sum of the individual Centres. Encapsulated within these principles is the notion that effective CPD can support and reinforce learning, changes in practice and professional development over entire careers, rather than just imparting knowledge or providing short term effects. Consequently while discrete course inputs may be valuable, more long term benefits and sustained positive developments have been shown as being more likely to result from continued exposure to appropriate and high quality professional development services.

However, this form of CPD demands the commitment of science educators and their employers, which will depend on a change in the culture of science education in schools and FE colleges. A series of previous research studies suggest that this represents perhaps the greatest challenge to the long term success of the initiative,

with key reports from bodies such as the Council for Science and Technology (CST)³ and the Roberts Review⁴ highlighting a range of pertinent issues. The CST report that key issues to be addressed include:

- Limited teacher exposure to science-specific, classroom-based CPD on a systematic basis to meet their individual development needs;
- The adequacy of school-based appraisal systems for assessing teacher performance and identifying development needs;
- The difficulties faced by teachers in identifying and accessing suitable services of an appropriate quality to support their continuous professional development; and
- The financial and time constraints which militated against participation in such professional development activities.

On the basis of this report, CST concluded that there was “*considerable scope for securing a step change in science teachers’ performance and hence in the science education of their pupils, by creating a pro-CPD culture, one in which a lifetime of professional learning is very much the norm and is assisted by modern, effective arrangements.*”

Consequently, the SLC initiative seeks to raise the quality of science teaching, and thereby positively influence pupils and students, through the provision of high quality, practical and up to date CPD for science educators.

2.3 The Regional and National Centres

As well as being funded through different routes, the Regional Centres and the NSLC also display considerable differences in their structure, staffing, and delivery and implementation approaches.

2.3.1 The National Science Learning Centre (NSLC)

The NSLC became operational in October 2005, and is housed in a purpose built building on the science campus at the University of York. The building has its own on-site residential facilities that support the delivery of multi-day provision. Its remit differentiates it from the Regional Centres through a focus on providing multi-day courses with on-site accommodation, to which it recruits on a national UK basis. Other specific features include the use of Impact Rewards, and the availability of bursaries to subsidise educator attendance.

The Centre also acts as a ‘hub’ for the nine Regional Centres, including leading on the development of the SLC Network, providing marketing services and building the SLC brand nationally, managing the SLC portal and providing a physical resource centre of science teaching support materials for the Regional Centres to draw upon. At the outset of the evaluation the NSLC had a complement of 24 staff (21.8 FTEs), significantly larger than the Regional Centres. In addition to the Director and Deputy

³ Science Teachers: A report on supporting and developing the profession of science teaching in primary and secondary schools. Council for Science and Technology; 2000.

⁴ SET for Success: The supply of people with science, technology, engineering and mathematics skills. The Report of Sir Gareth Roberts’ Review. HM Treasury: 2002.

Director, the Centre also employed Directors of Communications and Business, ICT and Resources and Finance. The White Rose University Consortium provides the underpinning partnership and an advisory group to the Centre.

2.3.2 The Regional Centres

The nine Regional Centres were initially established as single independent entities, and given a considerable degree of freedom to develop their structures, partnerships and service offers as best fits the needs of their regions. Seven of the Regional Centres are located within Higher Education Institutions, one in a science centre and another in a specially built building. All received funding from the then Department for Education and Skills to develop or modify their premises to offer classroom and practical sessions. The Centres aim to provide a conducive environment for learning, including up-to-date laboratory and IT facilities. Early in the initiative the Centres also sought to extend their reach and address the potential locational barriers their single sites presented by establishing locations for off-site delivery, which included specially equipped 'mini-Centres' and partner premises and, increasingly, direct delivery on school or college premises.

Each Regional Centre is underpinned by a 'core' partnership, based on their initial bidding partnerships. These commonly feature Higher Education Institutions (HEIs) which act as lead partners in all but two cases, where the lead bodies are a Millennium Science Centre (in collaboration with two regional HEIs) and the board of a joint venture company (independent of, but with representation from, regional HEIs). In addition to HEI representation, other core partners include:

- Regional and more local SETPOINTS representatives;
- Association for Science Education (ASE) representatives;
- Private sector science CPD providers;
- Local Authorities – and in a few examples individual schools and colleges; and
- Other organisations with a science focus – such as research facilities, museums and private sector science and technology focused companies.

In addition to their core partners, each of the Regional Centres had established less formal partnerships and collaborative arrangements with a range of regional and national organisations. These partnerships played a variety of roles, including joint service delivery and course development; supporting delivery by offering premises, resources and other facilities; and providing advice on course programmes and content. The Interim report also identified that local and regional partnership activity could have positive benefits for raising awareness of and promoting the Centres, and providing links to regional and national educational and science initiatives.

The Regional Centres differ considerably from the NSLC in terms of their staffing complements. The Interim report described how the Regional Centres had between 8.4 to 3.7 full time equivalent staff, some of whom were funded by their regional partners and host organisations. Not all had full-time Directors, and a trend was identified for the recruitment of staff with a business development remit based on initial experiences of the efforts required to market the Centres and generate throughput.

The Interim report also identified emerging differences between the delivery models followed by the Regional Centres and the NSLC. The requirements of the Regional

Centres' funding model and target regime meant that they had to respond to the demand most commonly articulated by their markets. These were most commonly for single, short course provision rather than the more longitudinal CPD originally envisaged.

2.4 Key Findings from the Interim Report

The Interim evaluation report was produced in November 2006, and reviewed the progress of the initiative, its successes and emerging impacts. The report also identified a series of challenges facing both the Regional Centres and the NSLC, and produced a series of practical and strategic recommendations.

For a number of the Centres, the 2005/6 academic year represented their first full year of operation, and marked the transition from a 'development' to more of a 'consolidation' phase. Their success included the establishment and staffing of the Centres and the delivery of their first programmes of provision, with most of the Centres exceeding their throughput targets and delivering over 15,000 CPD days between them. A further area of success was the establishment of closer links and the development of a more 'network' approach to relationships between the Regional Centres and the NSLC. The development and participation in Network steering meetings, sub-groups and other Network activities led many to consider that the network was becoming "*greater than the sum of its parts*", although more time was needed for its potential to be realised. Within this, the SLC portal was felt to have considerable potential for linking individual pieces of provision to create a continuous and planned CPD programme. However, its use by both the Centres and educators was variable across the network.

Views of the quality, appropriateness and potential for impacts to result from SLC services were positive, and supported by the early stages of the observational component of the evaluation. While the Centres' attentions focused on delivery rather than assessing impact, their customer satisfaction reports showed educator satisfaction across their services was high. The quality of provision and the presenters delivering it were highly rated, and where asked the majority of educators indicated that they would be likely to apply their learning to influence change in classroom practice. The Interim report concluded that the components were in place for positive impacts on educators to result.

The report identified that while good progress had been made in the implementation of the initiative, the Centres faced a range of practical and strategic issues as they entered the second full year of operation. These included:

- Continuing to raise awareness and establish themselves as key science CPD providers – which had often required greater effort than was initially anticipated;
- Stimulating demand for science-specific CPD amongst schools and colleges – in the context of limited school funding and teacher time, and other barriers to participation in science CPD;
- Extending market penetration and educator participation – to reach an increased number and range of users and allow observable impacts to result;
- Establishing trust and effective working relationships with key regional and national partners, stakeholders and CPD providers – and address concerns over competition and the duplication of services;

- Embedding the Regional Centres and the NSLC within their CPD infrastructures – including finding the most appropriate role and ‘strategic fit’ in the context of the existing provision; and
- Achieving financial sustainability – by extending market penetration at the regional level, while retaining the SLC mission of providing longitudinal CPD provision and cutting edge services.

2.5 The Baseline Survey

Following the production of the Interim report, a survey of science educators in Primary, Secondary and FE/sixth form colleges was undertaken to establish a series of baselines against which further developments could be assessed. As well as identifying educator attitudes to CPD and their awareness of the SLC initiative, the survey also identified the scale of the challenge in making science-specific CPD available at a level where sustained change can be expected. As the Interim report identified, this challenge is unlikely to be addressed by the Centres alone.

The full findings from the Initial Survey of Science Educators are available as a separate report, with the key findings being summarised below.

Establishing the Baseline – The Initial Survey of Science Educators

The Initial Survey of Science Educators took place between September and November 2006, and featured telephone interviews with 1,430 science educators based in schools and FE/sixth form colleges. The survey provided a series of ‘baselines’ against which future levels of awareness and participation in science-related CPD can be measured, explored science educators’ views and experience of CPD, and gauged their awareness of and participation in SLC services. The headline findings of the survey are summarised below.

The Wider CPD Context

- Survey respondents described a formalised infrastructure being in place to support educator CPD, with training needs being commonly discussed, personal training plans and CPD policies being in place and training outcomes being commonly reviewed and disseminated.
- On average, educators most commonly received between six and seven days CPD training in the 2005/6 year. However the number of days dedicated science-specific training ranged from 0.8 for Primary teachers to 3.5 for Secondary heads of science. A considerable share of educators reported not receiving any science-specific training in 2005/6.
- The educators reported a range of benefits resulting from their CPD activities, most commonly the introduction of new classroom approaches, impacts on pedagogy and the development of teaching styles to help encourage pupil interest. However, most seemed more able to recognise the benefits for themselves and their institutions than for their pupils.
- In terms of attitudes to training and professional development, most educators recognised the value and benefit of training and were satisfied with its quality and the ease of access. However, they often felt that insufficient time was dedicated to training, and while welcoming the opportunity for more were in some cases concerned with the availability of provision.
- A series of barriers to professional development were identified, including the cost of courses (particularly in the Secondary sector, and more influential than staff cover issues), a lack of suitable provision, and limited awareness of available provision. Concerns were also raised over the use of supply or other teachers to cover time away from the classroom.

Awareness, Use and Perceptions of the SLCs

- Levels of awareness of the SLC initiative were high in Secondary schools and FE/sixth form colleges, but considerably lower in Primary schools. Awareness seemed to depend more on the institutional setting and role of the educator than the region in which they were based.
- Around one in four Secondary heads of science and teaching staff in FE/sixth form colleges reported attending SLC provision, and at the time of survey an estimated 5% of all science educators in England had attended an SLC course and 3% an SLC event. However, SLCs were still referred to less frequently as potential or actual sources of science training, with Local Authorities being referred to most frequently.
- Educators attending SLCs were highly satisfied with their services – with the vast majority being interested in attending again and recommending them to their colleagues. Interest was also high amongst those yet to visit an SLC – particularly Secondary educators.

The following Chapters in this report describe the progress the initiative has made in terms of progress towards its short and medium term aims, and in addressing the challenges facing both the Regional Centres and the NSLC.

3 THE REGIONAL AND NATIONAL CENTRES

3.1 Introduction

As the previous Chapter described, the SLC initiative is delivered through nine independent Regional Centres and a single National Centre in York. Differences in funding and remit led to very different delivery structures and models developing at the regional and national levels, and to a lesser extent between the different regions. The key features of the Centres, and those which characterised the differences between them, included the number of staff employed, national or regional catchments and the services offered. The following sections review the key operational characteristics of the Centres, and progress made in 2006/7.

3.2 The Regional Centres

The Regional SLCs were visited twice as part of the ‘case study’ element of the study. These visits took place in late Summer/Autumn 2006 and Autumn 2007, and included interviews with Centre Directors and other key staff, participating educators, local and regional stakeholders, partners and providers. These interviews, alongside the review of Centre documentation and findings from other Components of the study, informed the evaluation of the operation of the initiative and the contribution made to any impacts identified. The second case study visits allowed progress to be reviewed over the preceding 12 months.

3.2.1 *Operational Models and Staffing*

The Regional Centres reported making **few major changes to their operational models and staffing structures in 2006/7**, and continued to deliver their services through a combination of Centre-based and outreach provision.

In several cases the Regional Centres had taken the opportunity to review their role and activities at a more strategic level. This had resulted in a change in the emphasis of some Director and senior staff roles, away from focusing solely on delivery and towards more of a strategic coordination and partnership development role.

Strategic Review

The West Midlands Regional Centre **reviewed its strategic aims and purpose** following its experiences of delivery in 2005/6, and a more strategic reflection on the role of the SLC. Concerns over achieving throughput targets had driven strategy previously, and had led to a model which was considered to feature too many courses, raise too little revenue and which was unsustainable.

The Centre has now developed a clearer and more strategic vision and sense of direction, based on a better understanding of the purpose of the Centre and its increased confidence and maturity as an organisation. It has developed five strategic priorities which underpin its business plan and guide its activities, rather than simply chasing throughput, with an increased emphasis on influencing cultural change.

The Centre has achieved its throughput target with less organisational effort being required to do so, which has allowed it time to undertake more strategic and cultural change activities. One key difference which has contributed to this is the re-thinking around the remit of the Centre and

innovation, with thinking moving away from running courses that no-one else had run towards the way courses are put together in combination, with any innovation having to fit with the Centre's objectives.

In the South West the **role of the Centre Director** had changed to taking more of a facilitative, project manager role, and spending less time on delivery. This involved the Director working more with partners, identifying potential funding opportunities and 'kick-starting' projects off rather than focusing solely on delivery.

The Centre had always valued the importance of partnership working highly, and had put considerable time and resources into establishing shared understandings and collaborative links across its region. These were starting to be exploited more effectively, as the Centre identified where, and how, it could add most value and avoid duplication, through close relationships with partner Local Authorities, Secondary National Strategy consultants, the Specialist Schools and Academies Trust (SSAT) and others.

For other Regional Centres, attentions continued to focus more exclusively on delivery, with the models followed and successes achieved being described below. A more strategic view across all the Centres may be increasingly beneficial to ensure provision is well targeted and plays to their strengths.

The number of **FTE staff** in the Regional Centres changed very little between 2005/6 and 2006/7, with each having fewer than 10 FTE staff and many considerably fewer. Each Centre now had a full-time Director post, and most had either recruited specialists or changed the roles of existing staff to support marketing activities. Two Centres had new Directors in place, with a third Director about to leave post at the time of the fieldwork. The West Midlands SLC described making a more fundamental change in its staffing model. While originally staffed by a Director and secondees from five partner organisations, the Centre had recruited seven members of staff whose job descriptions and roles more closely matched its revised priorities.

One change in Regional Centre staffing appeared to be the increased involvement of 'sector specialists', funded through different routes and with specific responsibilities for Primary, Secondary or Post-16 phases. This had led to a series of benefits for the Centres, including:

- Using the specialists' specific expertise in course development and delivery;
- Enhancing the credibility of the SLC through association – with the specialists frequently having good reputations in their fields within their regions; and
- Using the specialists' local and regional contacts to extend reach.

These benefits also allowed the Centres to increase market penetration, sometimes within core sectors they had found difficult to work in previously.

Post-16 Specialists

One Centre Director described having a new member of staff funded under Success for All to lead on Post-16 provision at the Centre. Previously the Centre had struggled to make headway into the Post-16 market, and recognised that face to face visits were needed. These are now taking place, as the specialist is also helping focus the Centre's offer to the sector.

Another Centre described how having a Post-16 specialist based at the Centre had led to a quadrupling of delivery to the sector, as well as strengthening its links with and contribution to the Teaching and Learning Change agenda.

3.2.2 Core and Regional Partnerships

While the Regional Centres' 'core' partnerships remained broadly stable over the 2006/7 year, the development of local and regional partnerships and increased collaborative working were one of the main successes across the Network.

Core Partnerships

The previous Chapter provided an overview of the 'core' partnerships underpinning the Regional Centres, which remained broadly stable in 2006/7. In a couple of cases they had expanded as new members became involved, and there had been the inevitable change in individual representation, but no significant changes were reported.

In a couple of cases the Centres reported that private sector representatives had disengaged from their partnerships. In both cases this was due to corporate decisions to review their role in, and resource allocation to, science education, rather than due to any dissatisfaction with their involvement with the Centres or the initiative.

Regional Partnerships and Collaborative Working

In addition to their core partnerships, the Regional Centres have also established relationships with a wide range of local, regional and national organisations and, in a couple of cases, with European partners.

Early in the initiative the Regional Centres had faced challenges in their relationships with some of their regional stakeholders and potential partners. There were several reasons for this, not least that the Centres were established in part as a response to perceived shortcomings in previous science CPD provision. Concerns over competition with existing provision and the duplication of services, and questions over the strategic rationale and role of the Centres, had in many cases led to difficulties in the early stages. Developing effective working relationships with their regional and local partners, of which there are many, has been a major task for the Centres, and one which required significant time inputs.

The evaluation found that the Centres had made good progress in developing relationships with their local and regional stakeholders. The quantity and quality of these relationships varies across the regions, with good examples of collaboration in some areas and examples where communications remain poor and links undeveloped despite the efforts of the Centres. The Interim report described the different ways in which the Regional Centres had acted to establish relationships with other regional agencies, and the benefits each offered, namely:

- **Communication** – including distributing information about the SLC to raise awareness and describe the services it delivers. The Centres also sought to support other regional providers by signposting educators towards them, and also signposting activity between Local Authorities, ASE and other local partners. These initial communications with partners were particularly important in establishing the Centres as 'honest brokers', and in establishing trust and setting the scene for more collaborative relationships in future.

- **Constructive engagement** – here the Regional Centres actively seek out other providers in their regions to establish collaborative working relationships – including contracting with providers to deliver services and allowing the Centres to be used to deliver providers’ own courses. These initial delivery relationships also evidenced the Centres’ commitment to future collaborative working, and address concerns over competition and service duplication.
- **Adapting to local/regional provision** – the Centres have increasingly attempted to focus their efforts where they perceive there to be gaps in available provision, in terms of coverage by both geographic and thematic areas. Again, by working with partners at both the local and regional levels, the Centres helped to confirm their commitment to avoiding duplication and to adding value.
- **Internal measures** – the Centres have followed other approaches to support their collaborative activities, including developing internal advisory groups with partner inputs, consulting with existing regional representatives and networks, and working with individual Local Authorities and educators in the development of their core course programmes. The Centres also routinely circulate their proposed course programmes prior to completion, to raise awareness and identify duplication.

Where positive relationships exist the Regional Centres have been able to work with their partners and stakeholders in a more coordinated way – for example working to identify where good provision is available and where gaps exist, and responding jointly with a clear division of effort and responsibility. While some Centres had placed more emphasis and invested more resources in establishing collaborative relations than others, continued efforts to build links at the regional level should remain a priority for the Network.

Relationships with Local Authorities

While established at the regional level, the Regional Centres have found that their most important relationships have often been at the Local Authority level, and particularly with science advisors and local Secondary National Strategy (SNS) consultants. The establishment of these relationships has not been straightforward in many cases, with initial tensions needing to be addressed. However, the establishment of increasingly positive relationships with Local Authorities was an important achievement for several of the Centres in 2006/7. While many new successes were reported in the final visits to the Centres, their own assessments of the strengths of their relationships with all their Authorities showed that there remains much work to be done.

The development of positive relationships with Local Authorities was due in the most part to hard work by the Centres. Key factors included committing resources to relationship building, establishing communication routes and trust, and seeking ways for the Centres and stakeholders to most effectively work together. These included:

- **Working with Local Authorities to plan and jointly deliver CPD services** – to ensure duplication was avoided. As one Centre Director described, the key to breaking down potential barriers with Local Authorities was to “*show they are not treading on other people’s toes*”, and are committed to avoiding duplication and working jointly to add value.

Example of Collaborative Working with Local Authorities

The South West SLC worked with a Local Authority in its area to jointly develop and deliver a transition programme for Primary educators, which was delivered through a series of twilight sessions on an outreach basis. Following the first course, the Secondary sector also showed interest and the course was extended to focus on the transition between Key Stages 3 and 4. More recently, the course has also been delivered in another Authority in the region.

- **Facilitating and providing venues for partner events** – ranging from hosting network meetings to organising conferences. Examples include hosting a regional conference for the Specialist Schools and Academies Trust (with 300 delegates), and providing a regional delivery site for an awarding body.
- **Bringing together educators from across Local Authority boundaries** – particularly when regional CPD infrastructures are perceived to be limited and face challenges in providing cost-effective CPD services.
- **Increasingly signposting the activities of other providers and partners** – and making cross-referrals between them as appropriate.
- **Having other organisations based at the Centres** – to support a climate of collaboration, for example representatives of ASE, the National Centre for Excellence in the Teaching of Mathematics and other regional and national organisations, and who can also promote SLC services.
- **Recruiting Local Authorities, teacher representatives and other partners to Centres' advisory groups** – for example to feed into programme development, provide a sounding board for new ideas and provide informal peer review. While not always successful, with educators and Local Authority staff often struggling to find the time to contribute, these approaches could provide helpful inputs and confirm the Centres' commitment to work in partnership.
- **Attending partner meetings** – such as Secondary National Strategy meetings at local and regional levels to promote joint working. One Director reported how previously the Centre had to "*fight tooth and nail*" to attend partner meetings, where now they are invited as a matter of course.

Other Centres described taking more specific steps to improve their relationships with potential regional partners, as summarised in the example below.

Engaging Local Authorities

The East of England Regional Centre described a dramatic improvement in its Local Authority relationships over the previous year. Recognising that it needed to engage with its Local Authorities more effectively, the Centre commissioned a scoping study which signalled that the SLC valued them as partners and were prepared to invest in identifying their individual needs. The Centre Director described the investment as the "*best £6,000 [they had] ever spent*", with the report providing an action plan for working with each Authority based on their individual CPD requirements.

Following the study the Centre has introduced termly dialogue with the Authorities which refer back to the action plan, clarify what has been achieved, and set priorities for immediate and longer term action. The Centre now always goes to the Authorities for meetings to emphasise its commitment, and confirms the outcomes and agreements reached by email. It has now established relationships with all the Local Authorities in its region – although the Centre recognises that some relationships are closer than others and that issues remain to be resolved.

The Centre has benefited considerably from its relationship-building efforts, in terms of the Authorities' supporting its marketing efforts (and so increasing throughput) and responding increasingly positively to collaborative working opportunities. The Centre now plans for each Authority separately, which allows it to take account of the different provision in each area, and has led to the Centre becoming provider of choice for three of its larger authorities.

In general, the Centres appear to have found it easier to build relationships with Authorities who are already engaged in, and value, science-specific CPD. In other cases, forming relationships with smaller Authorities with limited CPD provision can be more difficult, although these may be the authorities where SLC support could be most valuable. For example, in one smaller Local Authority yet to engage with its Regional Centre the science advisor described how their role was part time and precluded them from actively engaging with the Centre, despite several contacts and positive discussions. They were aware, however, that several schools in their area had used SLC services and reported positively, which the advisor has mentioned in their discussions with other schools.

Not all of the non-engaged Local Authorities held such positive views, however. While the majority were positive and some neutral, a couple were negative. In one case an SNS consultant described how, despite the Authority providing little science-specific CPD and seeking to engage with the Centre, little has happened involving the Authority in the previous 12 months. A couple of small projects with the SLC were started but have led nowhere, and the individual described: *"It's almost as if we're the forgotten people of [the Local Authority]."* In this case the Centre is set in a region where geography poses challenges, and where satellite centres were felt by the stakeholders interviewed not to be operating effectively.

Several of the Regional Centres had formed relationships with the Local Authorities closest to them, although others had invested considerable effort in relationship building across their regions from the outset.

Relationships with Other Regional Providers

In addition to Local Authorities, the Regional Centres had also taken particular steps to engage with other CPD providers in their regions. This was partly to address concerns over competition but also to allow them to scale up their services without taking on additional staff. In general other CPD providers were keen to work with the Centres, recognising that there are both commercial and wider benefits for them in doing so. Similarly, there are benefits for the Centres in terms of using providers already known and respected by the schools in their regions. However the use of local providers led some of the regional stakeholders to question the Centres' value added, although their coordinating role was becoming increasingly valued.

Providers' experiences of working with the Regional Centres were explored in interviews with 20 CPD providers during the final regional fieldwork. Each had provided services for at least one Regional SLC, and several had wider delivery experiences across the SLC Network. The providers ranged from individuals to large national providers, and included teachers providing CPD to their colleagues. While the providers' involvement with the Centres focused on course delivery, some had also been involved in SLC conferences and other events.

Working with the Regional Centres – External Provider Experiences

The providers were positive overall about their SLC experiences, and while these varied between the Centres common **strengths** included:

- The quality of the facilities – variously described as “*state of the art*” and “*excellent and good*”, with high quality ICT links at the Centres but less so in some outreach venues.
- High quality of staff – well regarded and professional – “*The Centre is run by committed people who do a good job*”.
- The support offered by Centre staff to providers – “... *a definite strength*” in terms of organising courses and helping with logistics like photocopying and materials production.
- The flexibility of provision and responsiveness of the SLC staff – e.g. being prepared to negotiate about ideas for CPD provision, and open to new ideas around potential provision.

One provider described the “*vibrant atmosphere*” at their local SLC – which helped overcome feelings amongst their Primary audience of being threatened or out of their depth, and helped to enthuse teachers. Others reported that the Centres were raising the profile of science CPD, acting as a central point for stakeholders and others involved in science CPD, and supporting collaboration more widely.

The providers also raised a series of **weaknesses**, which included:

- The physical location of some of the Centres – some of which were not central in their regions, could not be accessed easily by public transport, or had poor local or on-site car parking.
- High levels of course cancellation – with in several cases providers only being informed at short notice. One national provider described how cancellation rates across the Network were higher than they experienced with other clients, and made them, and other providers, question the effectiveness of SLC marketing and market intelligence.
- Bureaucracy – while views varied, the providers able to comment considered the effectiveness of administrative procedures varied between the regions. While some were effective, others were considered weak. While positive about the SLC mission and the people working in the Centres, several providers felt that the systems got in the way.

The majority of providers felt SLC services complemented what was already on offer, and that the Regional Centres had made considerable efforts to minimise duplication. Many described how their experience of working with the Centres had removed their initial concerns over competition. They also considered that the Centres were filling gaps in locally based science provision – for example in Post-16 services, and in complementing Local Authority services which had focused at the Primary level on literacy and numeracy.

Two respondents did feel that competition with existing providers was an issue, with one saying: “*Sometimes it is competing with other science providers, but it has more credibility and a better price because it is heavily subsidised.*” The other provider was more vociferous, stating that “*They shouldn’t be providing technician’s courses. We do this [for the Local Authority] and their courses are cheaper.[...] We have a business to run*”.

Other Regional Partners

Finally, the Regional Centres had also established relationships with other local and regional organisations. These most commonly included:

- Other HEIs in the region;
- Regional Development Agencies – in some, but not all, cases through links to regional STEM developments and partnerships;
- ASE, the National Advisers and Inspectors Group for Science (NAIGS), SETPOINTS and the learned societies, such as the Institute of Physics and the Royal Society of Chemistry;
- The awarding bodies;
- Special Schools and Academies Trust – and individual Specialist Schools;
- Private sector science companies and other science-focused organisations – including museums and science centres; and
- A range of STEM partners – including links with the National Centre for Excellence in the Teaching of Mathematics (NCETM), including joint service delivery and in several cases co-location.

Relationships with NCETM

Several of the Regional Centres described developing relationships with the Regional Coordinators working for the NCETM. These included:

- Providing hot-desk space at the Regional Centres and a venue for NCETM network and project meetings.
- Joint delivery of NCETM projects – for example three regions delivering a pilot project for maths and science teachers to promote their subjects, enthuse teachers and get them to teach at the overlap between maths and science.

3.2.3 Regional Centre Delivery Models

The differences in the delivery models followed by the NSLC and the Regional Centres have become more apparent over the course of the study, with the National Centre continuing to follow a more longitudinal model of multiple day provision, often with a residential component, and often targeting the areas of leadership and management where longer term inputs are required.

While the Regional Centres reported trying to provide courses of varying durations in 2005/6, the majority faced challenges in recruiting to multi-day provision in particular. In 2006/7, the Regional Centres all described a tendency to provide **courses of shorter duration** to meet demand, with the vast majority lasting for one day or less – although some were extended to one and a half days with ‘wrap-round’ pre- and post-course activities. Pressures to achieve educator throughput targets and progress towards financial sustainability, and the continued challenges of attracting educators away from the classroom, continued to influence regional delivery models. However, a predominantly short course model risks restricting the potential for impact, as well as representing a shift away from the original mission of the SLC initiative.

Recognising these demand challenges, and the issues associated with having single Centres in their regions, the Centres have taken steps from the outset to make their services more accessible. These steps include:

- Adopting an **outreach approach** to service delivery, alongside Centre-based provision – including establishing satellite centres across their regions, delivering services from partner premises, and working directly in single or groups of schools. Over the course of the evaluation the majority of Centres have increased the share of provision delivered away from the Centres. In 2006/7, this varied between the regions from most provision being Centre-based to up to two thirds being delivered elsewhere. As would be expected the share of off-site delivery frequently related to the geography of the regions, the position of the Centres within them, and the availability of transport routes. The numbers of off-site venues also varied considerably, with two Centres reporting using over 40 venues in the last two years. In some cases this had led to appreciably reduced use of the Centres themselves, and options for extending use were being considered.

While off-site delivery offered a series of benefits in terms of increased access and removing a barrier to attending CPD by delivering on school sites, less positive aspects were also recognised. These included the variable quality and availability of IT access; the quality and appropriateness of different venues; and not all having the quality of laboratory facilities enjoyed at the Centres.

Importantly, the evaluation found that many educators do not seem to be aware of the Centres' outreach offers, and continued to refer to 'the Centre' as being too distant for them to access. The Regional Centres should take steps to ensure that their outreach offer is promoted more effectively.

- From the outset, the Centres have used **external providers** alongside their own staff to extend the range and scale of provision they are able to offer, and allow access to a wider range of expertise and experience than is available in-house. In 2006/7 the Regional Centres used external providers to deliver between one third and three quarters of their services. Given the staffing levels in the Regional Centres, the use of external providers is crucial to maintaining current and increasing future throughput levels. External delivery also led to other benefits for the Centres, including:
 - Utilising providers' existing knowledge of local schools, their staff and their specific circumstances;
 - Enhancing credibility, in the early stages at least, by using providers known in their regions and/or with national reputations in their fields; and
 - Helping allay concerns over competition by evidencing a commitment to collaborative working, as well as providing new market opportunities.
- The Regional Centres all follow a model which offers a '**core programme of courses and tailored or 'bespoke' provision**, the latter featuring single courses or suites of provision tailored to meet the specific needs of the school (or schools) in question. Most commonly, but not exclusively, delivered on school premises, bespoke provision was seen as a way of developing longer term relationships, and delivering more 'continuous' professional development provision.

In most cases bespoke provision was made up of elements from existing courses, rather than wholly 'new' course provision. Most Centres found bespoke provision to be effective but time consuming and costly to set up, particularly given their low staffing levels – although some reported that bespoke provision could actually be simpler to set up and deliver. In 2005/6 the Regional Centres described how bespoke provision made up between 20% and 50% of their educator days. In 2006/7 most Centres described delivering more courses on a bespoke basis.

3.2.4 *Performance in 2006/7*

The 2006/7 year saw, for the first time, all nine of the Regional Centres **meeting and exceeding their educator throughput targets**, and between them delivering over 13,000 educator CPD days⁵. Throughput ranged from 113% to 157% of target, achieved through a combination of core programme and bespoke provision, with 'Network projects' featuring regional provision also making a significant contribution to their achievements. Beyond the formal 'DCSF' days, the Centres also worked with schools from the independent sector, and organised or facilitated a wide range of events, meetings and conferences. As well as providing an additional contribution to educator CPD, these events helped to evidence the Centres' commitment to collaborative working and helped embed them within regional infrastructures.

The Centres, in all but one case, also increased the number of educator days provided in comparison to the previous year. The greatest growth in throughput occurred in the three Centres not meeting their targets in the previous year, each of which achieved growth of around 50% on their 2005/6 totals. Elsewhere growth was more conservative, although one Centre reported a 29% increase. In the case where the total DCSF days fell below those delivered last year, the Centre still achieved 150% of its target.

The Centres also reported engaging with schools not previously using their services in 2006/7, although not all were able to quantify the extent to which they had improved **market penetration**. In one case the Centre reported having worked with almost one third of the Primary and almost three quarters of the Secondary schools in its region. Its analysis also identified that almost half of these schools had sent teachers for SLC provision on more than one occasion. This sort of data collection and analysis should be encouraged more widely across the Network.

Less positively, high levels of course cancellation continued to be reported across the Regional Centres in 2006/7, up to 50% of core programme courses in the most extreme cases. While this illustrates the continued challenges faced by the Centres in getting educators out of schools, many of the local, regional and national stakeholders interviewed considered that these levels of cancellation suggested variable levels of market intelligence and planning across the network.

As the previous section described, educator demand at the regional level had led to the Centres increasingly providing courses of a single day's duration. No clear patterns in demand appeared between the Centres by sector – although continued difficulties were reported in recruiting to cutting edge provision. A few of the Centres,

⁵ In terms of DCSF days, with additional days also being provided to the independent sector and through attendance at conferences and other events.

however, were more positive in terms of providing such courses in future, partly on the basis of delivering bursary funded provision (for example RCUK and a visit to CERN) which had brought teachers together around frontier science issues. Where Centres were more comfortable about delivering their throughput targets they were more likely to explore cutting edge provision in the future, and the Network could usefully explore how this could be focused and targeted.

3.2.5 **Service Quality**

The Regional Centres were widely regarded as delivering **high quality services** by their regional stakeholders and, as the findings on satisfaction would suggest, by the educators participating in them. This view applied to SLC services delivered both internally (i.e. by the Centre staff) and by other providers and partners delivering courses on their behalf. It would appear that the quality assurance approaches applied across the SLC Network are operating effectively, especially when applied to new providers by allowing any weaknesses to be identified early and addressed.

The study explored SLC service quality through the observation of a sample of SLC provision in the Educational Impact Study – both of which confirmed these positive perceptions of SLC provision. The key findings of each study in terms of the impacts of SLC services are again described in Chapter 6, with their findings on service quality being summarised below.

SLC Service Quality – the Educational Impact Study

The Educational Impact Study featured the observation of 22 CPD sessions across the nine Regional Centres and the NSLC, and interviews with Centre Directors, providers and participating educators. The sessions observed were delivered by a mix of external providers and SLC staff across the nine Regional Centres and the NSLC. In some sessions multiple presenters were involved, a few featuring teachers and research scientists, and included single day, multiple day and block residential courses.

The study found that all the sessions observed exemplified good practice in teaching and learning, with:

- Appropriately paced and structured delivery, that was well illustrated and relevant.
- Clear and appropriate learning intentions, well matched to teachers' needs and learning objectives.
- The use of a good range of appropriate teaching approaches, and new ideas modelled.
- Course leaders who worked hard to involve all participants, and provided opportunities for questions and discussion throughout.

Overall satisfaction with the sessions was very high amongst the educators interviewed, with all but two stating they had more than met their expectations. Course materials were well produced, with the resources provided for direct use in the classroom by most of the courses being particularly valued. Some areas for potential improvement were identified, including:

- The more consistent use of pre- and post-course tasks in short courses – while pre-course tasks were common, they often related to clarifying participants' learning objectives, and were infrequently referred to and not always shared with presenters in advance.

- Making course information more specific – with greater clarity of learning objectives and outcomes, and particularly to help ‘sell’ CPD provision to school management.
- Introducing follow-up activities after short courses – to help implement and embed learning to increase impact, as followed in the extended courses observed.
- Integrating the use of the SLC portal into short courses – and ensure that educators are made aware of its benefits and given a reason to use it following their courses.

The study concluded that the sessions had the potential to impact on either classroom practice or on the leadership and management of science, as fitted their objectives and delivery models.

3.2.6 *Customer Satisfaction*

Each of the Regional Centres have well developed approaches to monitoring the levels of educator satisfaction with the services they provide. In 2005/6 and 2006/7 very high levels of satisfaction were reported by the Centres, although differences between the approaches followed means that establishing an overall measure of satisfaction is not yet possible. Importantly, the Centres also use their customer satisfaction data as part of their quality assurance approaches, and routinely investigate and respond to any points of dissatisfaction as they arise.

The Early Impact Survey of educators using SLC services undertaken as part of the evaluation allowed satisfaction to be explored on a more common basis. While the main findings of the survey regarding impact are presented in Chapter 6, the findings regarding satisfaction with SLC services are summarised below.

Educator Satisfaction with SLC Provision – Evidence from the Early Impact Survey

The 893 educators previously using SLC services reported **high levels of overall satisfaction** with their experiences, with 89% reporting being satisfied (52% very and 37% fairly satisfied) and just 3% dissatisfied. While differences in satisfaction emerged between the Regional and National Centres and by educator type (with Primary educators more likely to report being satisfied/very satisfied than those in the Secondary sector, and technicians reporting less positively), overall satisfaction levels with SLC experiences were very high.

The survey also explored satisfaction with different elements of the design and delivery of SLC services, and identified high levels of satisfaction with:

- The relevance of provision received – rated positively by 91% of respondents, with little difference between educator types.
- Course materials and materials provided for use after the course – 89% and 81% respectively.
- The quality of training presentation received – 90%.
- The extent to which provision had met educator expectations – 84%.

On the basis of their experiences 91% of the educators reported that they would **recommend the SLC** to a colleague. This is particularly relevant given the number of respondents who had attended their course on the recommendation of a colleague. Indeed over half (54%) of the Heads of Science indicated that as a result of their recommendation a colleague had subsequently attended a course. Similarly, 91% of educators described being interested in attending SLC provision in future.

SLC provision was also considered to **compare well against other science-specific CPD** experienced by the educators previously. Half described SLC training as being better than other provision and only 3% not as good. Primary coordinators were the most positive in this regard, and technicians least.

3.2.7 *Impact of SLC Services – the SLC Perspective*

As the Interim report described, few of the Regional Centres had attempted to assess the impact of their services on educators and pupils in the 2005/6 year as they concentrated on establishing themselves and on service delivery. Consequently the impacts reported were largely anecdotal, on the basis of subsequent contact with educators and, where included as questions, positive responses in terms of intentions to apply learning in their customer satisfaction returns.

In 2006/7 the Regional Centres were still for the most part unable to provide any indication of their impact in their regions. Evidence of impact remained for the most part anecdotal, although the Centres were increasingly confident that they were having positive impacts on educators. It was commonly assumed that the combination of high levels of customer satisfaction and repeat business meant that their services must be having a positive effect, although the need to do more to assess impact on a Network basis was widely recognised. Some Centres had attempted to assess the impact of individual elements of their course provision, as in the example below.

Assessing Impact – Course Level Assessment

The East Midlands Centre had evaluated three elements of its provision – one course for technicians from the core programme, and two bespoke courses delivered for Primary and Secondary schools. The approaches used included:

- With the technicians – a survey of all the technicians in the region, follow-up questionnaires to technicians attending a four day SLC course six months earlier, and comparing the responses on a control group basis. A sample of respondents were then followed up, with classroom observations to evidence the effects of the training. Final interviews took place four months later with technicians and Heads of Science.
- With the bespoke courses – interviews with pupils, pre- and post-course attitude tests for teachers and pupils, and follow-up consultations with teachers six months after delivery.

The impacts identified included:

- **On Primary teachers** – the increased use of and familiarity with equipment in lessons, the demystification of science language, the increasingly routine use of investigation across the schools, increased cross-curricular thinking and improved teacher motivation and skills.
- **On Primary pupils** – evidence of improved learning and knowledge, better factual knowledge and increased motivation. The evaluation also suggested an increase in Year 6 science standards compared to Year 5, although it was recognised that this is difficult to attribute solely to SLC interventions.
- **On Secondary teachers** – the introduction of real life problem-solving to encourage investigation at KS4, the regulation of scientific terminology across Key Stages.
- **On technicians** – improved job satisfaction, greater responsibility for Science Clubs shared with specialist higher level teaching assistant, and increased professionalism and technical knowledge resulting in greater input to classroom technical support.

While the intensity of evaluative activity undertaken was recognised as not being practicable for all the provision, the findings of the studies had influenced course design and were shared more widely across the Network.

One development in 2006/7 has been the formulation and trial of the Impact Toolkit, developed as part of a TDA study into ways to stimulate the achievement of the impact of CPD provision. The Toolkit is underpinned by the premise that setting an expectation for impact at the outset of a course makes it more likely to occur, as does the involvement of educators' line managers and the clear statement of individual learning outcome at the start. The Toolkit is described below.

The Impact Toolkit

The East of England SLC had led on the trial of the Impact Toolkit across the SLC Network. The Toolkit aims to increase the likelihood of positive impacts resulting from SLC provision, as well as recording these impacts across the Network in a common and coordinated manner.

Based on good practice in CPD, namely considering outcomes and preparing for them in advance, capturing learning and developing action plans for future implementation, and involving both educators and their line managers, the toolkit consisted of four components:

- **Intended Learning Outcomes Tool** – a form to be completed jointly by the educator and their line manager and returned prior to the course, to set out expectations of the course and to anticipate and plan for impact.
- **Learning & Evaluation Tool** – used during the course to capture key learning points, and develop an action plan for implementation on the return to school. The tool was available in two forms – a grid and a more graphic 'nutshell'.
- **Impact Driver Tool** – for completion on the return to school, where the educator and line manager jointly review the action plan and use the form to capture potential impacts for the educator, their schools and colleagues, and on their pupils.
- **Professional Learning Accreditation Conversation Framework** – in the form of a guidance note to inform discussions between the educator and their line manager, and the rating of impacts on a 1 to 3 scale. These ratings are then consolidated and returned to the SLC where an Impact Certificate is awarded.

The Toolkit was trialled and evaluated, which showed it to be useful in the pre- and during course stages. However, its post-course use was not evaluated for time reasons, so there is no consolidated picture of impact as identified by the Toolkit.

The trial provided many useful lessons for future implementation, including: the time and resources necessary to collect, return and follow up completed forms; variable submission of Learning Outcomes in advance of the course; and issues using the Toolkit with external providers.

At the time of writing the use of the Toolkit across the SLC Network is being considered, although attentions have most recently focused on the re-contracting process. Several of the Centres have continued to use elements of the Toolkit, with some customising them further. In the evaluators' view, the Toolkit has the potential to move the Network forward on impact assessment, although its limitations are recognised in terms of implementation, objectivity and interpretation. However the Toolkit has the potential to identify the scale of potential impacts for more detailed verification and investigation, and would allow reporting at a higher level than throughput alone.

3.3 The National Science Learning Centre (NSLC)

The NSLC is funded independently of the Regional Centres, and also exhibits considerable differences in terms of its function, resourcing, structure and delivery model followed. It plays a key role as a 'hub' for the initiative, including hosting the SLC portal. This section provides an overview of the NSLC and its operations, before the portal is discussed in more detail.

3.3.1 Operational Model and Staffing

The NSLC operates from a single site on the science campus of the University of York, in a purpose built centre which also offers access to residential facilities. The building is owned by the University of York, with a service level agreement being in place between the Centre and the University.

The NSLC currently has 27.5 FTE staff, whose roles include: course development and delivery; a national marketing function (with the Regional Centres also being responsible for their own regional marketing); the operation and management of the SLC portal; and the establishment of links with national organisations and initiatives.

With the appointment of the NSLC Director as National STEM Coordinator in late 2006, and in response to the recommendations of the Interim report that a central contact point was required for the Network, the new post of Network Project Director was created. Based at the NSLC, the new post holder was responsible for taking forward Network development and coordinating the bidding for and delivery of a series of national projects. This role, and developments with the Network more widely, are discussed in the following Chapter. However, the NSLC and its staff have played a vital role in bringing the Regional Centres together into a more coherent and effective network.

The NSLC also leads on the initiative's links at the national policy level, where the Director of the NSLC has been influential in raising the profile of the SLCs and the contribution they can make towards national priorities. As the NSLC annual report describes, over the previous year these have included contributions to the Comprehensive Spending Review and the Sainsbury Review of Science and Innovation. More widely, the Centre leads on contributions to the STEM agenda, proposals to raise awareness of STEM careers, and working to develop a national framework to bring together the wider STEM community.

3.3.2 Partnerships

The key partnership underpinning the NSLC is the White Rose University Consortium, with a board featuring representation at the Vice Chancellor level from the four universities which comprise the Consortium. It also has an advisory board made up of academics from each of the four universities.

The NSLC has a range of national partners who fulfil a number of roles. The marketing partners help promote the initiative and the Centres, while financial partners provide funding for bursaries and other aspects of course delivery. The Centre also has a variety of delivery partners, including teachers, scientists, science education researchers and specialist providers across a range of scientific and educational disciplines. At the time of the last visit, the Centre was engaged in discussions with the Gatsby Trust to support the building and operation of a STEM centre, to extend its remit beyond science CPD.

The Centre has recognised that its delivery model is not currently sustainable if it were to rely on revenue from participating educators alone. It has found the use of bursaries to be essential in attracting educators, given the longer and more intensive nature of its services. The NSLC remains committed to the longitudinal model of provision, although like the Regional Centres it faces challenges getting teachers out of schools. In this case, these difficulties are exacerbated by the need to travel to the National Centre and the multiple day commitment its provision involves. The use of Impact Rewards, and their link to bursary payments, as described below, has been invaluable in securing attendance.

3.3.3 ***NSLC Delivery Model***

The NSLC delivers services to educators from across England, as well as from the devolved administrations. It differentiates itself from the services provided by the Regional Centres by providing more longitudinal courses, either multiple or linked days, and often including a residential component with accommodation being provided on-site. These courses focus more than the Regional Centres on leadership and management for science educators, which require longer term and more sustained inputs to be effective.

The NSLC has developed a system of Impact Rewards, which it has found to be effective in stimulating impact through a combination of action planning and setting an expectation that noticeable impact will result. The Impact Reward process is summarised below.

NSLC Impact Rewards

The NSLC uses a system of Impact Rewards to stimulate impact. Educators attending residential NSLC courses are asked to provide feedback when they return to the Centre on how they have progressed in terms of implementing their action plans and other learning from the course more widely. These impacts are then rated as high, medium or low impact, and consolidated to give an overall score.

In this way the NSLC tries to embed the learning from its provision in teaching practice and change the way participants think about their work – with evidence of educators disseminating their learning back in school being taken as one example of impact.

Participants who do not return after a single residential period receive their Impact Reward on completion of the course. However the Reward is subject to them attending all sessions, rather than evidencing what they have done on returning to school.

This approach also provides the NSLC with information on its impacts. By this measure, the NSLC annual report describes how 75% of educators participating in its services in 2006/7 rated the impact on their practice as medium to high.

The typical delivery model for NSLC provision consequently includes:

- Some preparation on the part of the participant before going to the NSLC;
- At least one day and probably more at the NSLC;
- Instruction on how to use the portal;
- A second residential visit to the NSLC some months later, at which participants report progress in implementing their learning and its impact on their practice to claim their Impact Rewards; and

- Further work between visits can be mentored on-line via the portal, although this is potentially very staff intensive and is not much used at present.

3.3.4 Performance in 2006/7

The NSLC reported delivering 3,600 educator days in 2006/7, a 16% increase on the previous year. The majority of educators attending NSLC provision were from the Secondary sector (80%), most of whom worked with Key Stage 4.

Satisfaction with National Centre provision, as reported by the NSLC's customer satisfaction approach, remains high. In 2006/7 over 91% of educators described their experience as either good or excellent. In addition, as reported previously, some 75% of participants rated the impact on their practice as medium to high via their Impact Rewards.

The Early Impact Survey of educators attending SLC provision also showed that satisfaction with NSLC services was high, with 94% describing being satisfied compared to 78% for the Regional Centres. Chapter 6 on impacts reports that educators attending the National Centre were more likely to report impacts across a range of variables – and shows how the longitudinal model followed can be successful in achieving impacts in certain areas in which single day courses may not.

The performance of the NSLC covers both delivery and more strategic activities across the Network more widely. Its influence on the development of the SLC Network has been key, as the following Chapter describes.

3.4 The SLC Portal

The SLC portal was developed as an on-line resource to serve a number of functions, with development being led by the National Centre. It is also a source of income as it supports both the NCETM and STEM portals. Portal functions include registering educators with the initiative, providing course information and an on-line course booking service, recording performance and management information for the Centres and nationally, and allowing educators to exchange information with their peers and with SLC staff. The portal also offers the opportunity to directly support continuing professional development activities by providing a link between discrete pieces of provision, supporting post-course activities, establishing communities of use both locally and nationally, and acting as a repository for course and other materials of relevance to science CPD. At the time of the second SLC visits the number of educators registered with the portal was approaching 26,000.

3.4.1 Portal Use by the Centres

As the Interim report described, initial use of the portal was highly variable across both the Centres and amongst educators using SLC services. While its potential was widely recognised, a series of issues were reported, including: initial incompatibility with Regional Centre IT systems and reported system instability, difficulties extracting performance data across a range of suitable variables, issues around data management (e.g. multiple registrations by individual educators) and concerns over the ownership of regional educator contact data by some of the Regional Centres. This led to some Regional Centres establishing, or continuing to use, parallel administrative systems. In addition, the Centres also reported concerns over the number of educators who were using the portal and the nature of this use, and described

teachers finding the portal unfriendly and use being concentrated in course search and booking activities.

In 2006/7 the use of the portal by the Centres for their own administrative and monitoring purposes, registering educators and booking courses increased across the Network. More of the Centres were also using the portal to post course and other materials for educators, and for communication between the Centres. However, a minority reported making limited use of the portal and the continued use of parallel systems for administration, marketing and monitoring purposes. These Centres considered that the portal continued to be operationally unstable (and prone to going offline regularly), not user friendly for educators and Centre staff, and unable to deal with the different monitoring and accounting procedures across the 10 Centres. These Centres also raised concerns over entering educator details onto the portal, as they were not sure how this data would be used and whether they would be able to access it (at no charge) in the future.

Across the Centres issues continued to be raised regarding the portal including:

- Portal functionality – with continued concerns over ‘user friendliness’ (particularly amongst teachers with varying IT capabilities), capacity limits for Centres uploading materials, and the ability to view inactive courses by date.
- Requests for monitoring information by funders – rather than using portal data directly and which, although understandable given variation in use by the Centres, was a continued issue for those using the system for administration and performance monitoring.
- A perceived shift in the focus of portal use – becoming primarily a promotion and course booking tool, driven more by marketing objectives than providing learning opportunities, and with little incentive for educators to register other than to book courses.
- Continued difficulties in introducing and demonstrating the portal at satellite Centres without internet provision – while one Centre reported introducing the portal in these instances via hard copy, this approach was less than satisfactory.
- The continued inability to view other Centres’ courses, materials and online communities – with several Centres considering that security settings could be lowered to allow more open sharing of practice across the Network.

3.4.2 Educator Use of the Portal

The Regional Centres commonly described use of the portal by educators as limited, and confined to finding and booking courses rather than higher level and value added activities. The Centres described attempting to use the portal to disseminate course and post-course materials, as well as developing post-course dialogue between participants, but with few successes.

A range of reasons were cited by the Centres for the limited post-course use of the portal by educators, including:

- Access issues – with teachers having limited internet access at school, not having separate email addresses, and having insufficient time to spend exploring the portal. In addition, not all educators were considered to be comfortable with the internet, with their capabilities in this area varying

considerably. One Centre also considered whether logging on to the portal every time it was accessed could limit educator use of higher-level functions, and wondered whether an auto-identifier would be helpful.

- Portal issues – echoing earlier comments about functionality and user friendliness, several Centres were concerned that technical weaknesses could limit educator use and risk putting educators off its use in the future. In one case, the Centre reported continuing concerns that issues with functionality and user friendliness risked damaging the credibility of the wider initiative, and described only using it in a minority of their courses.
- External provider issues – two Centres described how they had found external providers to be less willing to promote the portal or post materials and resources on it. This was considered to be due to providers protecting their own interests, and directing educators towards their own web presences.

Some of the Regional Centres had tried different approaches to getting educators to at least explore the portal following attending provision – including not providing course materials at the end of sessions but posting on-line instead. However, none of these appeared to be successful, leading one Centre to suggest that educators were more interested in “resources that they can use tomorrow” than in more reflective portal use.

The majority of Centres described routinely introducing the portal during the majority of the courses they offered, although a minority reported doing so less regularly. Centre testimony and observed practice showed that the portal can be introduced effectively as part of a single day course, although the observation and follow-up work suggested that educators attending extended programmes at the National Centre were more likely to use the portal after their courses. This was due at least in part to the wider exposure of educators to the portal and its benefits that more extended courses could offer. The provision of a range of downloadable documents, curriculum plans, web directories and links to other materials appeared to have encouraged participants to continue to use the portal. The observation work concluded that course participants must have a clear reason for using the portal, which in turn means they need a clear understanding of the benefits of further portal use and how to realise them.

The survey of educators using SLC services provided further insights into portal use, and suggested that either exposure to the portal during course provision was more limited than the Centres suggest, or that recollections and impressions were limited.

Educator Use of the SLC Portal – Evidence from the SLC User Survey

Fewer than half (45%) of the 893 educators responding to the User Survey reported that their most recent SLC course had included any information on the SLC portal, although one in four were not sure if the portal had been introduced during their course or not. Recollection amongst educators attending the National Centre was higher than for those attending the Regional Centres (87% vs 36%) – although the majority of the educators, irrespective of the source of provision, found the information provided useful.

Irrespective of whether their most recent training had covered information about the portal or not, **around one third of users (34%) described making use of the portal since their training.** Secondary teachers and Primary science coordinators were most likely to have used the portal (at 40%), but the greatest difference was between NSLC and Regional Centre users.

Those attending the National Centre were three times as likely to have used the portal than the Regional Centres (76% vs 26%), and were also more likely to have used a wider range of portal functions than those attending the Regional Centres. Looking for additional training opportunities was the most commonly reported use of the portal, with educators attending the National Centre being more likely to use the portal for a range of different functions than those attending the Regional Centres.

Future developments proposed for the portal, such as the introduction of a professional development needs assessment tool and the expansion of the portal resource bank, were seen as positive steps that could be attractive to educators and stimulate additional use. However, questions remain over whether portals and other web-based approaches can effectively add value and support educator CPD, and if so how this can be achieved. More broadly, the need was expressed by the Centres for a Network-wide vision and strategy for on-line provision, encompassing both the portal and other potential e-learning approaches. This was, however, expected to be resource intensive in terms of both development and implementation costs, and may take time before any benefits are realised.

More broadly, many of the Centres seemed to see the portal as a 'National Centre' function, and one over which they had only limited control and influence, despite their involvement in the appropriate working group. Issues over the use of regional educator data, and continued concerns over functionality, suggest that many of the Regional Centres feel limited ownership of the portal, and so are less likely to 'buy-in' to its use and invest in its implementation. The new contract arrangements for the Network may offer the opportunity to address the issue of ownership – and more importantly provide both a stimulus for and raise the importance of the portal in supporting the establishment of common practices and procedures.

4 THE SLC NETWORK

Summary of Findings

Having been established as nine Regional Centres and the NSLC at York, the SLC Network made considerable progress in terms of formalisation and the degree of collaborative activity between the Centres.

Strengths and positive developments include:

- The development of a Network Strategy, with a clear aim and objectives at the strategic and operational levels.
- The introduction of the Network Project Director post – which has driven development forward, provided a single point of contact for the Network, and secured a series of national delivery projects.
- The ability of the Network to provide a ‘single voice’ for the initiative and the individual Centres, and have influence at the national level.
- Increasing, and increasingly valued, collaborative activity between the Centres – with the peer support offered being highly valued by the Centre Directors.

Challenges include:

- For some Centres, finding time to contribute to the level they would have liked.
- The perceived uneven distribution of contributions to Network wide activities across the Centres, and of resources being out of alignment with these responsibilities.

4.1 Introduction

This Chapter explores the development and increased formalisation of the SLC Network, its particular strengths and weaknesses, and further options and opportunities for further development.

The initiative was originally established as nine Regional Centres with a single National Centre at York. Each Centre operated independently, with separate contracts with their funders (the former DfES for the Regional Centres and the Wellcome Trust for the National Centre), and individual targets for educator throughput. As the Interim report described, this had resulted in a series of tensions between the Regional Centres, and between the Regional Centres and National Centre. Issues included the emphasis on achieving individual throughput targets limiting collaborative activities and a view that referrals between the Centres were not reciprocated, which had led to perceptions of inequity and competition. Issues were also identified over the ability to collaborate on the development and running of joint courses across the Centres, with differences in funding and management structures affecting the practicalities of delivery and resources available for Network projects. The funding model also limited the extent to which Centres could share financial and cost information to support joint planning.

Despite these tensions, considerable progress had been made in establishing a national Network, led by the National Centre with the active participation of all the

Regional Centres. All the Centres have realised a range of important actual and potential benefits for the future of collaborating – including profile raising. The Interim report made a series of recommendations for the continued development of the Network, including establishing a single point of contact for national organisations seeking to engage with the initiative, establishing common strategic leadership by extending the remit of the Director of the National Centre to lead on the Network, and reviewing the structure and remit of the Network sub-groups to best harness talent and maximise added value.

In 2006/7, positive progress has been made in the development of the Network, with the development of a formal Network Strategy and increasing collaborative activities. While joint working between small groups of Regional Centres had been a feature of the initiative from the outset, collaboration on a coordinated 'Network-wide' basis has increased – the benefits of which are beginning to be realised.

4.2 Network Strategy

Building on earlier developments, and to drive the Network forward, a Co-ordinators Group was established by the funders of the initiative, and a Network Project Director appointed to lead the Network's input to this group. The Network has clarified its aims and objectives and the means by which these will be achieved through the development of a Network Strategy, the overarching aim of which is to:

"Improve the quality of science teaching and learning through effective continuing professional development for all those involved in science education."

This aim is supported by four strategic objectives, which are to:

1. Supply effective, high quality CPD to increase science educators' awareness, understanding and confidence by updating their subject knowledge, pedagogical skills and appreciation of careers from science;
2. Stimulate demand for CPD and embed it as an intrinsic and ongoing part of science educators' professional life;
3. Work strategically with partners in the wider science education community to coordinate and improve access to CPD at the local, regional and national levels; and
4. Establish Network cohesion, coordination and direction to operate efficiently and effectively.

The Network's Operational Plan also sets out a series of operational objectives for each strategic objective, which show how the development of a cohesive and effective Network is intended to contribute to delivery across all four strategic objectives. For example, under the fourth strategic objective, operational objectives include planning and implementing improvements to the SLC portal, reviewing Network groups to implement strategy, reviewing Network project processes and systems to support them, and reviewing and improving internal communications. The more formalised Network 'went live' in April 2007.

4.3 Network Structure and Delivery Model

4.3.1 Network Project Director

The post of Network Project Director was created as a 12 month secondment with the aims of supporting the Network's contribution to the Co-ordinators Group, and acting as a central coordinating point for the Network and its external partners and contacts.

The latter aim responded to the views expressed by the initiative's national partners and stakeholders that their engagement at the national level was hampered by the absence of a single point of contact. As Chapter 5 describes, this development was welcomed and valued by the national stakeholders and organisations interviewed, although concerns were raised as to whether a single post was sufficient to deliver this remit in future.

While identifying the need to support the Network Project Director, the Strategy suggests that Centre Directors and Deputy Directors will be nominated to maintain day-to-day communication with individual organisations. While this may be satisfactory for the management of ongoing project work, it diverges from the stakeholders' wish for a single access point. It also raises issues around implementation and communication, in particular the reliance on nominated Directors and Deputy Directors to provide feedback on their discussions to other Network members and the Network Project Director. Here the Directors' Group provides an appropriate forum and communication route, and the Network Project Director also described establishing a protocol whereby she is kept informed of working relationships between the Centres and national organisations. However, this approach relies on Regional Directors and their Deputies having sufficient time to dedicate to these 'national responsibilities' – both organisational and thematic. For example, the Network Project Director currently passes enquiries relating to the Primary sector to the Deputy Director of the East of England Centre, who leads in this area. This role can be particularly resource intensive, and it will be important that the Network recognises the level of commitment required and provides resources accordingly. Balancing any additional central resource for the Network with the need to draw-on and draw-in the Regional Directors will require careful consideration.

More broadly, the Network Project Director also described how variations between the Centres' host organisations and administration practices can make the establishment of standard agreements (especially financial contracts) with national organisations difficult. An additional issue is the variation in VAT registration across the Network, which can lead to double charging because if the NSLC acts as the central administrator, it has to add VAT to bills that in some instances already have VAT included – thus the 'customer' is paying VAT on the VAT. It is vital that some way is found to overcome this, as it is a significant barrier for national organisations that have to negotiate ten separate contracts and deal with ten different invoicing arrangements. Variability in prices between Centres, while explained by variations between hosts, does not show the Network in the best light.

4.3.2 The Directors' Group

The Directors' Group meets on a monthly basis, either face to face or via video conferencing, with face to face meetings being scheduled with meetings of the Co-ordinators Group.

The purpose of the Directors' Group is to coordinate policy and practice across the Network, grouped into six specific areas which are then taken forward by the appropriate working groups. While quality is a cross-cutting theme across all the working groups, the Directors retain overall responsibility to ensure that the Network quality assurance system is being followed.

The Directors' Group also agrees an annual action plan of activities to be taken forward across a series of working groups, as described below.

4.3.3 Network Working Groups

The Network currently has six working groups, namely:

- Primary Development Group;
- Secondary Development Group;
- Post 16 Development Group (the Teaching and Learning Change Programme);
- Communications Working Group;
- Learning and Technology Group; and
- Impact and Research Group.

The Primary, Secondary and Post 16 Development Groups are the most recently introduced, and aim to develop a common CPD curriculum across the Network based on national priorities and encourage the further exchange of courses between Centres. The National Centre report for 2006 also describes the roles of the other groups. The Communications Working Group is working to extend reach and communicate success; the Learning and Technology Group is raising awareness of the portal, identifying barriers to its use, and exploring virtual learning environments and e-learning opportunities; and the Impact and Research Group is developing common needs analysis, evaluation and impact assessment tools as well as leading on CPD accreditation. The sharing of good practice on delivery and marketing are common objectives across the six groups.

The working groups consist of staff from the SLCs and are usually chaired at Director level. They meet at least four times a year, with individuals and small groups being tasked to take forward specific actions to implement the annual action plan. The groups also address issues outside of the action plan as they arise, and, following the recommendations of the Interim report, use a 'task and finish' approach to specific pieces of work. Monthly reports on the achievements and issues facing the individual groups are provided to the Directors' Group, and in turn they receive reports from the Directors' meetings.

Resourcing the activities of the working groups is an area of continued discussion, with an agreement being reached that the network will contribute towards the work of the chairs while the amount of support offered, the deliverables expected and mechanisms for distribution remain to be finalised. Work by Regional staff on Network projects has so far been on a voluntary basis, and not all of the Regional Centres have had the capacity to engage equally.

4.4 Network Marketing

A key initial role of the Network was to market the initiative on a national basis, raising awareness and supporting the establishment of the SLC brand. In 2006/7 the focus of network marketing has been on advertising and promotion activities that direct educators towards a regional or national SLC course – for example where articles on the SLC website direct individuals towards specific provision. The SLC newsletter has taken on an increasingly regional flavour, with the regional page moving from the back to the front page, and including features which again link to SLC provision.

Opportunities to use partners to market the SLCs are also increasingly being followed, with a resource being allocated for this to include developing information and copy for placement in partner newsletters.

A specific communication strategy has also been developed to keep national stakeholders and partners informed of network developments, which utilises a combination of newsletters and email communications which feature case study examples.

More locally, the intention is for the Regional Centres to become the 'sales force' for the initiative, and continue to visit schools and Head teachers to develop relationships further. This includes specifically targeting schools in challenging circumstances, with school contacts being managed through the 'Spirit' database augmented with school data from DCSF. It is hoped that these developments will enable increasingly targeted marketing approaches on the basis of greater market segmentation.

4.5 Network Achievements in 2006/7

In addition to the increased formalisation of the Network and the development of the Network Strategy, the National Centre report for 2006 also reports that increased collaboration between Centres has led to more exchange of good practice and increased value for money and effectiveness through the joint development of courses. One example of this is the development of three Primary courses to respond to the varying availability of support for primary schools at the Local Authority level. As the Primary National Strategy does not cover science specifically, this is considered to be an area of opportunity, and a course programme is planned for implementation across all nine of the Regional Centres.

The interviews with the national stakeholders suggest that the Network is becoming a more recognisable entity and more straightforward to engage with. However, as the following Chapter describes, there remains work to be done before it is viewed as a coherent and consistent whole rather than the sum of its disparate parts.

Another area of continued success is the capacity to successfully bid for, and deliver, national CPD programmes. At the time of interviews with the Network Project Director the Network was delivering 18 projects with a combined value of over £1.8 million, seven of which were funded by DCSF either directly or indirectly through intermediaries including STEMNET and the Learning Skills Network. Network projects included:

- Royal Society of Chemistry (with the Department for Innovation, Universities and Skills and GSK) – a three year programme to deliver four days of practical chemistry to up to 2,700 teachers;

- Research Councils UK – 160 ‘teacher days’ of CPD on cutting edge science;
- Royal Society – a course at NSLC for scientists wanting to work with schools; and
- DCSF and Institute of Physics – CPD and action research in 30 schools to improve progression by girls to A level physics, extending to 100 schools.

These Network projects have and will continue to make a significant contribution to Centre throughputs.

4.6 The Regional Centre Perspective

There has been a high level of involvement in, and commitment to, the development of the SLC Network amongst the Regional Centres, through attendance at various Network meetings, membership of initial working groups and engagement in collaborative activities and Network projects. While during the early stages of the evaluation a series of initial benefits of operating on a more networked basis were emerging for the Regional Centres, the intervening 12 months has allowed these to crystallise further. While many of the challenges to networking and collaborative activities remain, not least finding the time to balance limited staffing complements with the need to achieve throughput targets, the Centres remain committed to the continued development of the SLC Network. Indeed, in many cases the continued development of Network projects was providing dividends for the Centres which, for the majority, outweighed or at least balanced the resources required.

4.6.1 Network Benefits

Commitment to, and involvement in, the Network has remained high across all nine Regional Centres, with a common view that the Network had made considerable progress in the 2006/7 academic year. Participation in the Network was highly valued across all the Regional Centres, with a range of benefits being described which built upon and extended those identified in the Interim evaluation report. These specific Network benefits emerging over the previous year included:

- Improving the cohesion and coordination of activities across the Centres – with more joint working between the Centres, undertaken in a more coordinated and efficient manner, and the development of common positions on key issues;
- Providing a ‘strategic voice’ for the initiative and the Centres – to lobby on the importance of science-specific CPD and coordinating a single response to consultations;
- Enabling enhanced and more effective engagement with national stakeholders and programmes – notably through the establishment of a single contact point, but also the increased ability to mobilise and more effectively handle Network-wide projects and issues;
- Enhancing the profile and credibility of the initiative and the individual Centres, while also beginning to address the concerns of certain larger/national stakeholders;
- Starting to reduce course development costs, and the trial and error associated with new course development, through more joint development work; and

- Moving towards more consistent approaches across the Centres and the SLC brand – although this was widely acknowledged as an area where much remained to be done.

At the same time, the Regional Centres continued to emphasise the continued benefits of the Network in terms of providing peer support (described as “invaluable” by one Director), offering a forum for the exchange of ideas and practice, and establishing supportive links and cross-referral routes. The general view emerged that while the Centres had collaborated in groups of two and three in the past, often in adjoining regions, the Network has helped foster more extensive links. Several Directors described how their main collaborative activities with other Centres are now through the Network.

The increased ability of the Network to have influence at the national level was an important benefit for many of the Regional Centres, with the Director of the National Centre’s dual role as the National STEM Director being seen as particularly valuable in this regard. This allows the Network to be represented on a range of key committees, policy forums and other influential groups at the national level, and so helps to facilitate engagement and joint working with the SLC initiative.

4.6.2 Continued Challenges

While the overwhelming view was of a year of positive development for the Network, many of the Centres also recognised that there remained much work to be done and a few held less positive views. Several Centres referred to the difficulties in finding the time to participate as fully as they would have liked and, as reported previously, found the requirements of chairing Network working groups had significant opportunity costs. In both instances, the Centres would benefit from specific resources to support future involvement in the Network, especially where their contributions to its operation are considerable.

While collaborative working between the individual Regional Centres and with the National Centre had increased, there remained some more negative views in terms of the degree to which the Centres were committed to using any materials resulting. In a few cases the view emerged that despite resource pressures some Centres were contributing more than others, which was perceived as limited commitment to the Network.

While the increased formalisation of the Network was widely welcomed, a couple of Centres considered that further formalisation was necessary to provide a more robust framework to equalise contribution and benefit. One considered that a more formalised approach should be applied to the allocation of responsibility for the delivery of Network projects, and the selection of the projects for which they bid. Conversely, while welcoming the formalisation of the Network, one Centre was concerned at the possibility that more ‘informal’ networking opportunities would be lost. They had benefited considerably from informal discussions with the other Regional Centres, which allowed for more open discussions of good practice and collaborative opportunities outside of the congested agenda at Director and policy meetings.

In all cases, the importance of the Network Project Director role was emphasised, and the recent incumbent praised for her efforts and energies in moving the Network

forward. The Network Project Director post was considered to be essential for the continued development of the Network.

4.7 Future Developments

The final stages of the fieldwork took place following the announcement of the requirement for the Centres to bid for continued DCSF funding on a Network basis but prior to the bid being submitted. While the Centres were optimistic of their likelihood of success, a degree of uncertainty was only to be expected regarding the future nature and trajectory of the Network.

For the most part, the Centres viewed the move towards the Network funding approach positively, with the potential benefits cited including:

- Continuing to drive momentum towards a more formalised Network, and continued moves towards more effective collaborative operations;
- Making the members of the Network operate together more closely and effectively, and raising the importance of the Network with the individual Centres;
- Removing the barriers to the exchange of information and competitive pressures between Centres under the initial contractual arrangements, and a move towards planning on a Network rather than an individual Centre basis as previously;
- Providing an opportunity for the Regional and National Centres to revise their individual and common mission, to ensure they remain fit for purpose, and review and provide clarity on the relationships between the Regional and National Centres;
- Allowing more opportunities for engagement with national agendas, and associated programmes and projects, to extend reach and work with a wider range of educators; and
- Being able to distribute a nationally set performance target across the regions, and relate this to regional staffing complements.

There were, however, uncertainties of how the Network would operate, which most commonly related to the balance between 'central' and 'regional' control, the potential loss of regional 'distinctiveness' and autonomy, the continued ability to ensure that local educators' needs are met, and whether Network projects should be taken on centrally and delivery devolved as necessary.

5 NATIONAL STAKEHOLDER UPDATE

Summary of Findings

- This Chapter provides the findings from interviews with 26 national stakeholders, the vast majority of whom were interviewed at the start of the study.
- While the initial stakeholder interviews identified a range of views on the initiative, some quite hostile, the national stakeholders were found to have become less antagonistic on the basis of positive reports from educators and the view that the initiative was 'here to stay'.
- This had led to many developing ways of working with the Network – in some cases this remains superficial (e.g. hiring rooms for conferences) but in other cases there is evidence of deeper collaboration.
- A challenge for the future was seen as developing a model of CPD that ranges from whole school, to in-school, to days out of school on courses, including subject specific courses; and that sees the National Strategies and the SSAT identifying schools that would benefit from SLC training. Including a review of the role of SLC provision would become part of developing a school improvement plan.
- The second challenge is ensuring that teachers take up the CPD opportunities on offer. A change in culture towards CPD courses during holidays is a way forward many stakeholders are now discussing. A more qualitative measure of success for the Centres needs to be found to stimulate change.
- There is tension between those who believe that all initiatives must have a direct and immediate impact on classroom practice and those who believe that CPD for teachers should be a requirement that will raise the status of the profession. Those in the latter camp believe that longer term, the impact on students will be greater and longer lasting than a short term focus on school improvement initiatives. To best serve all children, immediate impact is required but longer term the system may be better served, and less pressured, by raising the quality of educator input.

5.1 Introduction

This Chapter presents the findings from a programme of qualitative interviews undertaken with 26 national stakeholders, to explore their perceptions of the SLC initiative and its implementation to date. As part of the baselining, we interviewed stakeholders in the summer of 2006. The same stakeholders were recontacted during September and October 2007. The only exceptions were two private companies. One was reallocated as a regional contact as they had only had contact at the local level. A similar, international, company was contacted instead. Another company was reallocated as a national stakeholder rather than a local stakeholder as their comments related to the national, rather than local, context. It should be borne in mind when reading this section that stakeholders are basing their views on different levels of awareness of, and engagement with, the initiative.

Our respondents fell into two main groups: those from the education world with responsibility for CPD, for whom science was one subject among many; and those from the scientific world for whom science education was one issue among many. A few straddled these two sectors. Last year we found responses strongly coloured by whether the respondent's organisation (rather than the respondent themselves) had an

educational focus or a scientific focus. This year this divide was less clear cut. The perceived quality of the courses has impacted on views, as has Government commitment to the continuation of the initiative.

The findings of the stakeholder research are reported under the headings below:

- The Science Learning Centre Initiative – reviewing the national stakeholders' views on the concept of the initiative and the delivery model.
- The SLC Network – exploring views on, and experience of working with, the Network.
- The SLC Offer – reporting stakeholders' perceptions of the content and quality of the offerings and marketing.
- The Impact of the Initiative and Barriers to Realisation – reporting the impact that stakeholders perceive to have resulted from the initiative to date.
- Working with the Devolved Administrations – experiences to date.

5.2 The Science Learning Centre Initiative

In general views have become less antagonistic, primarily for two reasons. Firstly, because there is now widespread acceptance that the Centres will be a permanent feature of CPD for science educators, at least for the foreseeable future, and secondly because stakeholders have heard that feedback from teachers who have attended courses has been positive. Stakeholders have become reconciled to the continuation of the initiative. Those working on Government education initiatives, which are often seen as competing with SLCs, are therefore developing ways of working with the SLCs, although there is still some latent hostility among some in this group, who maintain that the out-of-school, course-based model of CPD is not the most effective. The professional bodies and other institutes used to working with Government initiatives remain committed to supporting the initiative, despite practical difficulties. Industry, although based on a small sample, seem more willing to work outside the SLC network to minimise costs and maximise impact.

There is some feeling that the Centres (especially the regional Centres) are still searching for a role and that there remains work to be done to position the SLCs within the wider CPD framework nationally but more especially, regionally. For a minority, the initiative is seen as a lost opportunity because of the limited addition the SLCs make to what was previously available, and what was perceived by some as a poor use of funding on under-used facilities and marketing "gizmos". Some stakeholders felt that *"it is a shame that the Centres are not better used"* because of the quality of the facilities. Many stakeholders told us that whenever they visit Centres *"they are not buzzing...I wonder how well they are really used."*

5.2.1 SLCs in the Context of STEM

There is still some concern about broadening the initiative's mission to include all STEM subjects. Last year stakeholders feared that this might dilute the SLC's focus on CPD and educators. However, this year we found stakeholders, in the main, supportive of the idea of STEM Learning Centres. Many stakeholders felt that the agenda has moved on and that while Science Learning Centres were right for their time, there is now a need to draw in mathematics, put more emphasis on engineering and technology and draw together resources that support science educators. Indeed, engineering organisations found the emphasis on science in the title off-putting.

The virtual model of the National Centre for Excellence in Teaching Mathematics (NCETM) was mentioned as an alternative model in passing by some stakeholders but comparisons were not explored. It is still early days for the NCETM but stakeholders will be interested in comparisons between the two approaches.

5.2.2 The Implementation Model

As background, it should be noted that the TDA has lead responsibility for CPD in England but had only recently taken on this role at the time of interview last year. It now has a more developed CPD strategy and science is a strategic subject. This, along with TDA membership of the High Level Steering Group (HLSG), has raised the level of engagement the TDA has with the SLC initiative. In addition, John Holman's membership of the HLSG has helped to build relationships.

The conflict between the in-school and course-based models of CPD remains but appears to have diminished for several reasons.

- Some of this conflict has been resolved because the Centres, in designing their courses, have tried to build in a long term aspect which research evidence shows has most impact. They have achieved this by asking educators to do preparatory and follow-up work. At the NSLC courses take the form of two periods of two or three days residential, with educators being required to feedback what they have done between the sessions at the second session. Certificates are not issued until follow-up work has been completed at both Regional and the National Centres. We were told that the NSLC has made three to four day training courses acceptable.
- Stakeholders believe that many educators, especially at Primary level, do not like to travel far. The Regional Centres have developed two approaches to respond to this. They have developed a bespoke service over the period since the last evaluation visits and some who work with schools to raise attainment have begun to recognise a role for off-site courses alongside in-school models of CPD. Additionally, the development of satellite centres has addressed some concerns about the accessibility of the Centres.

The opportunity for teachers to meet outside of the day-to-day school environment was thought to be valuable by some stakeholders and this is an important aspect of the SLC model. It provides time and space for a different type of reflection from that offered by other CPD models.

The course-based model was nevertheless criticised because it was said that it could never reach all science teachers.

Getting teachers out of school is still said to be the main challenge for the future. Two issues were raised in relation to this – ensuring teachers put aside time in the holidays for CPD and working with Heads to demonstrate the benefits to the school of individual CPD. Some schools are beginning to understand how to get the most from the regional SLCs but it was said that many need to become more sophisticated buyers of CPD. Interestingly, this year we heard less about DCSF giving teachers an entitlement to CPD and more about teachers committing more of their own time.

There is still concern that SLCs have not bedded-in with other relevant Government initiatives at the local level, most importantly the Secondary National Strategy (SNS) and Local Authorities but also the Specialist Schools and Academies Trust (SSAT). It

was suggested that these groups could work together better than they currently do. SNS consultants and Local Authority staff know schools well and the SSAT know the specialist schools well. This in-depth knowledge could be used to enable SLCs to develop appropriate courses to address specific needs. The SNS and Local Authorities could promote SLCs for certain types of training, while themselves focusing on in-school provision. The regional case studies suggest that this has started to happen with some Local Authorities. However, there remain some fundamental disagreements, and possibly concerns about job security, between supporters of different models of CPD which continue to be a barrier to this level of co-operation. As one stakeholder said: *“everyone may need to change a little”*.

It was generally thought that SLCs currently work with the better resourced and higher achieving schools. Stakeholders who are involved in other Government education initiatives felt that the SLCs should more directly target low achieving schools, as these are the schools that most need support. It was acknowledged that this would need intense resource and a bespoke approach, but was essential to stop the gap between good and poor schools escalating. Another view held that many schools need CPD support, not just those targeted by the SNS and that each initiative had to find its own niche.

5.2.3 The Funding Model

The main trigger for releasing DCSF funding to the Centres has been educator throughput. Again, many questioned whether this was the best measure of success. It was felt to have distorted the nature of the courses on offer, encouraging the Centres to offer more ‘general’ courses that attract a wider range of educators. It was also said to militate against the development of on-line training. Questions were repeated about what pay-back period should be expected and when, and indeed if, the Centres would ever be able to be self financing.

Concerns remain about the pricing of SLC services, which were considered expensive by some stakeholders who had run courses at or with SLCs, but too cheap by Local Authorities. One international corporate stakeholder told us that despite strong support for SLCs, they could not justify the costs of providing their courses with the SLCs. Regional Centre charges for administration, accommodation, etc. are much higher than the cost of the company providing this themselves, and using other venues. Local Authorities, by contrast, thought that SLCs’ charges were forcing them to reduce their prices to uneconomic levels.

Some of the stakeholders interviewed had provided bursaries to teachers, while others were in the position to do so. As before, there was some wariness about subsidising costs, with at least one stakeholder being reluctant to provide funds due to a concern over market distortion as they could only pay for certain types of courses given their organisational objectives. There is considerable reluctance to fund teacher cover. Indeed, three of the four businesses we spoke to expressed a reluctance to provide funding for teacher cover, travel and subsistence. They stressed that any funding they were likely to contribute would be directed to supporting specific courses that met their business objectives, which is more easily justifiable internally.

The lack of high profile business support served to make some businesses wary of involvement and to question the success of the initiative.

One stakeholder felt that the root of many problems lay in the hybrid model of the Regional Centres. They are neither businesses that partners can deal with in a commercial relationship of buying services, nor universities with similar objectives to many in this field.

5.3 The SLC Network

The SLC initiative was not originally set up as a Network of Centres, but rather as nine individual Regional Centres (with separate contracts with the Department for Education and Skills) and a National Centre (with a contract with the Wellcome Trust). Hence each Regional Centre and the NSLC has a different set of aims and objectives which is seen to be a weakness for the Network and to cause difficulties for partners.

The Centres have tried to operate as a Network for some time, with views differing between stakeholders on the strengths, weaknesses, effectiveness and potential of the evolving Network. It remains the case that some Centres appear to stakeholders to be more actively involved in the Network than others. In general, Network projects rely on individual Centres volunteering to undertake specific tasks and activities, although there is now a small budget for Network activities which is drawn from Centre budgets. The reason for varying degrees of involvement cannot be assessed by stakeholders but the perceived extent of involvement in the Network clearly colours views of individual Centres and Centre Directors, although some conceded that this might be a result of the host institution rather than SLC staff.

An analysis of relationships between individual stakeholders and individual Centres reveals very little, beyond the importance of geography for private sector companies, who tend to work most with Centres close to their plants.

The appointment of the Network Project Director has made a major impact on relations with national stakeholders. This post enables stakeholders to engage with a central point, rather than with individual Centres, although stakeholders feel the post is overstretched and there can be delays in getting a Network response. Nonetheless, some courses are still not offered nation-wide, despite this more centralised approach. The ability to roll out their courses across England is vital for many stakeholders in order to meet their own objectives.

Some organisations reiterated that they could offer the Network development opportunities and were perhaps more exasperated than disappointed that their resources had not been drawn upon. However, at present all SLCs, including the NSLC, have limited capacity to work with stakeholders and so must prioritise.

5.3.1 The Regional Structure

Most (but not all) national stakeholders were aware that the funding model has moved on and that the re-tendering for a national Network was underway. In the light of these developments there was little need to discuss the original regional structure. All the stakeholders we interviewed were pleased at the proposal for a more coordinated approach with the National Science Learning Centre (NSLC) in the lead. A single point of contact remains important for national stakeholders who want uniformity of delivery as well as ease of access and administration.

Stakeholders continued to recognise considerable variation between regional Centres in terms of their administrative systems, charging structures, provision and engagement with the Network.

Again there were comments about the management capabilities of the Regional Directors. Moreover, it was said that below Director level, many Regional Centres are quite weak. A few stakeholders also felt that SLC teams should have individuals with direct recent experience of teaching in school, but were not sure that all did.

Some stakeholders assumed that differences in charging stem from the host organisations. Nevertheless, all hoped that a central billing system as well as standard rates would be offered in the future to reduce the administrative burden on partners.

Provision is not seen as sufficiently consistent across England and this was perceived as a weakness. There is a universal belief that the same courses should be on offer at all Centres, with a few courses aimed at addressing local needs. Several stakeholders said that they found it hard to believe that CPD needs varied significantly across the country, and some saw it as a matter of equity that educators should be able to access the same provision.

5.3.2 *The National SLC (NSLC)*

Since the Interim report, John Holman has stepped back to 50% of his time as Director of the NSLC after being appointed STEM Director on a 50% basis early in 2007 for 18 months. This has meant that John Holman has had a very high profile in the STEM community, which has led, serendipitously, to greater contacts for the SLCs. Most stakeholders saw this as positive for the initiative. However, it was felt to call into question the extent to which the SLCs are independent of Government, and so how independent their advice on science CPD could be.

John Holman's role in the SLC initiative has become even more central to outsiders and he appears to have become yet more of a central contact point. This is exactly what the national stakeholders want – a single, identifiable head, who can be easily contacted as a first point of call in the development of projects and relationships. Interesting, one stakeholder suggested that John Holman's current position has left a space that a Regional Director could have filled but none have taken the opportunity.

5.3.3 *Marketing*

Marketing at the local, course specific level, was thought to be particularly weak because of the low level of course take-up evidenced by high levels of cancellation. Several stakeholders wondered whether the right communication channels were being used. More than one stakeholder told us that in joint marketing exercises they had generated a better response than the regional SLCs.

Some stakeholders had no idea how local marketing of courses was done. Others felt that there was over-reliance on flyers that stakeholders thought may never reach educators. We were told that in this crowded market face-to-face communication is vital and that more needs to be done by the Regional Centres to build relationships and develop links with schools at an individual level. Some Regional Centres have realised this and started to employ staff to develop these individual relationships.

5.3.4 Partnerships

The nature of the science CPD world necessitates working in partnership with other providers and the SLCs were said to need to work harder at this. It was suggested that the SLCs need to develop a much better understanding of potential partners and their objectives to facilitate better partnership working. Partnerships with industry were said to offer a link with “*the real world*” that can give insights into careers and stimulate interest among students, while partnerships with Higher Education Institutions (HEIs) were thought to help to broker links between schools and HEIs to support the widening participation agenda.

In general, stakeholders feel that they make all the running in initiating partnerships, although Centres have initiated some partnerships. A view comes through that at least some of the Regional Centres are thought to be arrogant; unwilling to accept a course developed elsewhere, including at another Centre. This not only makes stakeholders call into question their willingness to work as a unified Network, it also leads them to perceive Centres as overly academic, because it is part of academic culture to design courses within the HEI and not to take courses from elsewhere.

Partnerships between the Centres do not work as well as stakeholders expect. Communication between Centres and with outside partners can be slow and this makes it difficult for stakeholders to manage their projects. Those stakeholders who have been asked to speak or who have experience of course delivery were critical of communications between outside contributors and the Centres during preparation.

5.4 The SLC Offer – Views of Products and Services

The Centres continue to operate in a potentially crowded market, where numerous bodies, including professional and subject bodies, research funders and learned societies, offer CPD support to science teachers. While issues of potential competition and the duplication of provision were raised by some stakeholders, the bodies described above are, for the most part, content to defer to the SLCs in CPD provision as long as they can be assured of quality and attendance.

However, how the Centres identify need and develop courses is a black box to most stakeholders; no clear process is evident from the outside. Inconsistencies between Centres lead stakeholders to believe the system of new course development is very ad hoc and based on what Centres want to do rather than any needs assessment. One stakeholder recommended that SLCs need a research budget to help them understand need more effectively and how to enable teachers to be released from school.

Last year we found a strong feeling of competition from other Government initiatives, many of which provide CPD, or advice on CPD, as part of their core business. In addition, Local Authorities and awarding bodies provide CPD. This sense of competition and overlap was less prominent this year and it appears that the various initiatives are working together better than before. There is now widespread acceptance that the SLCs will be funded for the foreseeable future and it seems that systemic conflicts have been accepted and stakeholders are now working round these. Other stakeholders are beginning to see these ‘conflicts’ as complementarities.

5.4.1 Content of Provision

In general, some stakeholders felt that the SLCs were not engaged with Government initiatives, such as school improvement. Neither did some feel that they were

sufficiently engaged with developments in the curriculum, despite being the lead on the roll-out of the new Secondary curriculum. Employers, with limited resources for engagement, thought they should be able to use SLCs as links to the curriculum but it was felt that the SLCs were not sufficiently close to the curriculum to play this role. Some directors come from HE and are not seen as having recent classroom experience. Staff below director level are largely unknown. It was also felt that the Regional Centres need to respond to changing teacher priorities by changing the courses on offer.

The General Teaching Council for England (GTCE) 2006 survey of teachers highlights teachers' demand for subject specific CPD. Half of the respondents to this survey identified subject specific training as a personal training need for the next 12 months, rising to 56% among classroom teachers. While this covers all subjects, at least one of the policy bodies we interviewed was beginning to recognise that science teachers might need up-dating on a more regular basis than some other subjects.

Last year we found some scepticism about the need for cutting edge science training for teachers but this appears to have reduced, although there remains a debate over whether it is needed and if so the context and format required. Some stakeholders felt that attending general talks on cutting edge subjects, while interesting and potentially inspiring, does not provide support to teaching. The need, we were told, is for cutting edge science in the context of the curriculum. Questions were raised about the extent to which SLCs could provide this without strong collaborations as their staff are neither teachers nor scientists. Others questioned the economic viability of courses on cutting edge science and Local Authorities, we were told, would not offer such courses because of lack of demand. We consider there is a need for research to clarify the level and nature of demand for cutting edge science among science teachers and schools.

The quality of science teaching at Primary level was felt to have declined as teachers who underwent training when the National Curriculum was introduced move on or retire. A growing need at Primary level was identified by several stakeholders. At Secondary level, the development of the 14–19 curriculum and the new diplomas were thought to offer significant opportunities to increase demand for the Centres as teachers will need considerable support to deliver these effectively. These developments also offer opportunities to support educators and to work with businesses.

There was some feeling that the courses on offer are not focused on school priorities, which are more about schools than individuals, but others felt that SLCs could support other Government initiatives that are designed to focus on whole school issues. Better use of schemes of work to identify need and devise courses was recommended. In general questions were asked about how well the Centres keep up with curriculum developments.

5.4.2 Quality

While all the stakeholders stressed that they had not received structured feedback on SLC provision, and that their comments were based on reporting 'anecdotal' information, the feedback they reported from educators using the Centres was generally good. However, there is concern about variability in quality and the reluctance of Regional Centres to implement tried and tested courses, whether tested

by outside partners or by other Centres. Conversely, Regional Centres are seen by some as places where others deliver their courses, for example, ASE. The Royal Society of Chemistry (RSC) and the Institute of Physics (IoP) courses use RSC and IoP presenters under the banner of the SLCs.

The small staffing levels at the Regional Centres also raised concerns about the quality of the courses and the depth of thought and experience in course development. There was a perception that one person devised a course, with no recourse to outside oversight. Generally, it was thought that the Regional Centres are not sharing enough.

However, the quality of the administration and marketing was thought to be much poorer. While there was less discussion this time of marketing, issues of administration were raised by those who had worked with Centres as deliverers. Communication between the Centres and external deliverers is not ideal and this inhibits quality preparation. These problems do not seem to be apparent to those attending the courses.

It was also pointed out that the apparently fairly frequent cancelling of courses will have an impact on perceptions of courses and of the initiative as a whole.

5.5 The Impact of the Initiative and Barriers to Realisation

This section explores the perceptions of the stakeholders interviewed regarding the impact of the initiative to date, and the potential and actual barriers to accessing provision that may limit potential impacts in the future.

Last time we found that stakeholders had not thought that more capacity was required in science CPD and this remained the case. However, it was said that the SLCs had brought gravitas to the field and that is important.

5.5.1 Impact on Teachers

The stakeholders were only able to provide limited information on the impact of the initiative on teachers, although they considered that positive impacts on individual teachers should have resulted from attending courses.

5.5.2 Impact in the Classroom

Stakeholders still felt it was too early to say whether the SLC initiative has made an impact on classroom teaching, and thereby on students. There also remains the feeling that the number of teachers attending is not yet sufficient for the initiative to have had a significant and identifiable impact on schools and students. Moreover, stakeholders felt that many classroom teachers, perhaps up to two-thirds, remain unaware of SLCs.

There was some feeling that attitudes towards CPD in schools are beginning to change, but very slowly. Heads who have been through leadership training may see the role for subject specific CPD more clearly than older Heads, but their focus remains on whole school activities to improve pupil attainment.

5.5.3 **Barriers to Achieving Impact**

The stakeholders also described what they considered to be the key barriers and challenges in achieving impacts with teachers, schools and ultimately pupil interest and attainment. These are described below:

- **School-based barriers** – schools were said to remain reluctant to release teachers for CPD during school time for reasons including budgetary and time constraints. The chartered teacher and chartered science teacher initiatives do not seem to be encouraging CPD. One stakeholder told us that schools assess the impact of CPD in terms of numbers of pupils reached and length of contact time. So for example, chemistry specific CPD for Key Stage 3 for an individual member of staff would only impact on the students who were taught one subject a few hours a week, at one KS by an individual teacher, whereas whole school training will impact on all students all of the time. A suggestion to improve take-up of CPD was to provide schools with ring-fenced funding for CPD. Finding out what CPD is available and what is worthwhile remains a barrier for some teachers, as does the variable appreciation of the downstream benefits of teacher CPD on pupils.
- **Model-based barriers** – as discussed above, in the view of some of the stakeholders the SLC model militates against strong classroom impact, because research shows that CPD makes the biggest impact when it is continuous and school-based. The Centres have tried to develop courses that embed reflection and in-school exercises in response.

5.6 **Working with the Devolved Administrations**

The NSLC has developed relationships with Scotland and Northern Ireland and Techniquet in Wales. In Scotland and Northern Ireland the model is for the NSLC to work with organisations in the country to develop courses and for those organisations to deliver the courses locally.

The new Scottish Government made a manifesto commitment to languages and science and this is being reflected in submissions to current spending reviews. It is anticipated that there will be money allocated to further CPD support for science educators. There is now increasing guidance on 'expected outcomes' at each point of education, which is also driving the need for CPD. The Scottish Schools Equipment Research Centre (SSERC) has traditionally been the main source of CPD support for Scottish science teachers and has developed its capacity over the last year. Its relationship with the NSLC has developed well but there is a feeling in Scotland that the NSLC does not put enough emphasis on relationships outside England.

In Northern Ireland, policy is continuing as before and there has been considerable learning from the partnership with the NSLC. In Wales we understand that Techniquet has approached the SLC Network with a view to exploring future opportunities.

6 SLC IMPACTS

Summary of Findings

The evaluation identified that the Network is delivering a range of positive impacts to educators, schools and pupils. These were explored through a quantitative survey of 5,000 educators using SLC services and the observation of provision and follow-up work with educators.

The quantitative Early Impact Survey found that:

- The most commonly reported impacts were on individual educators, with around eight out of ten reporting positive impacts on their motivation and subject knowledge.
- Eight in ten also reported impacts in the classroom, with three quarters reporting impacts on pupils' learning and interest, and more broadly on pupil motivation and achievement.
- Impacts on schools and colleagues were reported less frequently, but still by over half the educators responding, although fewer reported impacts on CPD culture at their schools.
- The likelihood of impact varied by educator type and sector. Broadly Primary educators were most likely to report positive impacts, although in the case of wider school effects coordinators and Heads of Science were more likely to report positively.

The Educational Impact Study found that:

- The sessions observed exemplified good practice and had the potential to have a positive impact on the leadership and management of science or on classroom practice.
- No single model of delivery was found to be inherently better than another – with the match between participants' needs, course content and delivery models followed being key to impact.
- A strong longitudinal component results in greater impact in schools. Even in one day courses impact was greater when pre and post activities were used.
- Follow-up is time-consuming but important to maximise impact. Very few participants had been contacted in any way following attendance at short courses.

Key factors influencing impact were also identified, including:

- The use of pre-course information to identify educator expectations of learning outcomes.
- The inclusion of a longitudinal elements in provision, including for shorter courses effective pre- and post-course task setting and follow-up.
- Whether educators had discussed their experiences with their line managers after attending the course.

6.1 Introduction

This Chapter sets out the findings of the evaluation to assess the impact the SLCs are having on the educators using their services, the schools they work in and on the pupils and students they teach. It also describes the impact of the Centres on the

wider culture of science-specific CPD in schools and colleges, drawing on evidence from:

- The Early Impact Survey of SLC users – to identify their experiences and the benefits and impacts resulting from them.
- The Educational Impact Study – featuring course observation and follow-up with participating educators.

6.2 SLC Impacts – Findings from the Early Impact Survey

A quantitative postal survey of 5,000 educators using SLC services between March 2006 and May 2007 was undertaken to identify the early impacts of the SLC initiative. An additional 63 in-depth telephone interviews were also undertaken with survey respondents, to explore their experiences in more detail and provide illustrative examples. The educators were asked to report on the impacts resulting from their most recent experience of SLC provision.

Educator details were collected for each of the 10 SLCs, either from records held on the SLC portal or directly from the Centres themselves. The survey took place between 24 September and 2 November 2007, with a total of 893 responses being received (a response rate of 18%). This level of response allowed for analysis by educator type with the exception of individuals working in FE, where insufficient returns were received to allow valid comparisons. In addition to standard data tabulations, the survey data was also analysed to explore factors influencing the impacts achieved. Where comparative data is included in the following sections, all differences are statistically significant at the 95% confidence level.

To set the context for the assessment of impact, the educators were also questioned on other aspects of their SLC experiences, including:

- How they first heard about the Centres – with direct marketing by the Centres and word of mouth from colleagues being the main mechanisms.
- The number of courses attended in 2006/7 and the most recent SLC course attended – with the majority attending between one and three courses in 2006/7. In terms of their most recent provision, 72% reported attending one of the Regional Centres and 18% the National Centre.
- Other engagement with the SLCs – while the most common form of engagement described was for course provision, almost one in four (23%) described attending conferences and other events organised by the SLC.

In describing the impacts resulting from their participation, the educators were asked to rate whether 'some' or 'a great deal of impact' had been achieved. Those responding reported a range of positive impacts resulting from their involvement with the Centres. The most commonly cited impacts were on their personal subject and pedagogical knowledge, confidence and motivation; followed by classroom impacts and effects on pupils; and influences on their colleagues and schools more widely. The positive impacts reported are summarised below, with the tables showing combined totals for 'some' and 'a great deal of impact' unless stated otherwise.

6.2.1 Impacts on Educators

Table 6.1 shows the proportion of educators responding to the survey reporting positive impacts as a result of the participation in SLC provision, overall and by educator type and setting.

Impact on educator:	All	Primary Teachers	Primary Coordinators	Heads of Science	Secondary Teachers	All Technicians
Motivation	85%	92%	94%	82%	84%	79%
Subject Knowledge	79%	86%	87%	68%	73%	85%
Confidence	58%	78%	77%	46%	59%	40%

Impacts on individuals were the most frequently reported in the survey, and were the areas where ‘a great deal’ of impact was most often reported (by 22% of respondents on personal motivation and 18% on subject knowledge).

The impacts reported tended to be those which are most rapidly, and perhaps easily, recognised. However some respondents (between 3% for personal motivation and 13% for confidence) expected further impacts in the future. The table highlights the differences in the shares of educators reporting impacts by type, with Primary educators most frequently reporting individual impacts:

- All educator types report impacts on their **personal motivation** – particularly Primary teachers and coordinators at 92% and 94% respectively.
- Similarly, educators in the Primary sector were most likely to report positive impacts on their **subject knowledge** – 86% of Primary teachers and 87% of coordinators. A high share of technicians (85%) also reported positive impacts in this area, with subject knowledge being the impact most frequently reported.
- Impacts on **confidence in the classroom** were also highest for Primary teachers (78%) and coordinators (77%). As would perhaps be expected more senior and long serving educators were less likely to report a positive impact on their confidence, in the Secondary sector at least. Just 40% of technicians reported positive impacts on confidence – although this is likely to be a function of their limited role in the classroom.

The in-depth follow-up interviews with educators responding to the survey provided further insights into the different types of impact reported, as well as the interplay between them. The box below provides a series of quotes from the follow-up interviews.

Educator Impacts – Qualitative Examples

The follow-up interviews identified how educators’ SLC experiences had proved to be **inspirational and motivational**, with one Secondary teacher stating that *“Motivationally [the course was] better than any other course I have done”*.

Impacts in terms of **increased confidence** were also commonly reported, for example:

“I wasn’t very confident in undertaking investigations but after the course I was a lot more confident” – Head of Science in Secondary Education.

“I was relatively inexperienced at the start so it helped build up confidence that I could pass on to [other] teachers” – Teacher in Further Education.

This increased confidence often led to a greater willingness to **test and introduce new teaching approaches**, as the following examples illustrate:

“Now I have got more experience and more confidence, and I feel more able to introduce new ideas and information to teachers and pupils” – Teacher in Primary Education.

“I have never had any confidence with microbiology. On the course they showed us how simple and controllable things were and as a result we were able to do more stuff, it’s opened up more avenues” – Teacher in Further Education.

SLC courses were helping to extend educators’ **subject knowledge**, which in turn raised both educator confidence and enthusiasm for their subject – as the following examples suggest:

“It increased my subject knowledge and this helped me be more passionate about the subject in hand” – Teacher in Secondary Education.

“[The course] brought me further up to speed, gave me techniques that I could make into games and other activities out of, that I can use in class” – FE Teacher.

Educators also reported benefiting from **exposure to new or updated teaching techniques and practices**, many of which had been used in the classroom and shared with colleagues:

“Some activities were developed during the course, I tried them myself and shared them with my department, that brought us into line with some areas of biology that are fast moving” – FE Teacher.

“We now have access to a vast set of resources available online – we have been able to pinpoint and select resources more confidently” – Secondary Teacher.

Finally, improved confidence and practical experience was felt to have **improved educators’ abilities to interact** effectively with their pupils – for example:

“It has enabled me to improve experiments and make them more interesting for pupils. I think it also helps teachers to do practical work” – Teacher in Further Education.

“[The course] has improved my understanding and ability to have discussion with pupils” – Teacher in Secondary Education.

6.2.2 Impacts in the Classroom and on Pupils

High levels of positive impact in the classroom and on pupils and students were also reported. Table 6.2 shows that almost three quarters of educators reported positive impacts in the classroom, which in two thirds of cases had resulted in impacts on their pupils and students. Around one in ten also expected further impacts in future.

Impacts:	All	Primary Teachers	Primary Coordinators	Heads of Science	Secondary Teachers	All Technicians
In the Classroom	73%	87%	85%	77%	80%	46%
Pupil Learning	67%	88%	86%	77%	78%	23%

& Interest						
Wider Pupil Impacts	66%	89%	83%	76%	77%	27%

Importantly, teaching staff were considerably more likely to report impacts in these areas than technicians – with:

- Almost four in five teaching staff reporting positive impacts in the classroom.
- Three quarters indicating improvements in their pupils’ learning and interest.
- Three quarters claiming that there had been wider impacts on their pupils, such as on their motivation and achievement.

Primary educators were again more likely to report impacts on the classroom and on pupils than their Secondary colleagues – and were most likely to report ‘a great deal’ of impact rather than ‘some’ impact on pupils’ learning. This was also the area where educators commonly expected further impacts to result, as the influence of their enhanced knowledge and skills translated to changed classroom practice. Conversely fewer than half of the technicians reported any direct impact on the classroom or pupils, again due to their role and limited ability to have a direct influence.

Educators also reported a series of wider impacts on their pupils, including their increased ability to work with a wider range of pupils, improved motivation and raised achievement. Positive impacts were reported in all these areas, with Primary teachers and coordinators describing them most frequently (89% and 83% respectively).

Educators commonly referred to a range of benefits from SLC provision which underpinned the classroom and pupil impacts. These included: improved access to more engaging teaching resources, the introduction of more and increasingly ‘hands on’ practical sessions, and the exposure to new lesson ideas. Others mentioned being more likely to encourage pupils to learn through investigation, to build on their interest and enthusiasm. Examples of educator comments from the qualitative follow-up contacts are provided below.

Classroom and Pupil Impacts – Examples from the Qualitative Follow-up

Educators indicated that they had received **new ideas about how to teach certain areas**, and about extending their reach to a wider range of pupils:

“I realised there were more ways of teaching physics than I thought there were” – Teacher in Secondary Education.

“We came back with ideas such as [how to teach] gifted and talented pupils” – Teacher in Secondary Education.

“With the children I could do real experiments with the wow factor and the children were completely engaged” – Primary Science Coordinator.

In terms of impacts on **pupil engagement and learning**:

“It helped me in Science Week at school with staff – pupils really related” – Primary Coordinator.

“The impact has been pupil engagement and learning a variety of teaching methods” – Teacher in Secondary Education.

“If you have done the course it is like your reputation goes up – the pupils view you differently – they listen to you more – you have more authority” – Teacher in Secondary Education.

“It has helped the pupils learn everything in a fun way” – Teacher in Secondary Education.

“The materials helped the children – they took more interest” – Teacher in Secondary Education.

6.2.3 Impacts on Schools and Colleagues

Impacts on schools as a whole and on other colleagues were reported less frequently than those on individual participants or their classroom practice and pupils. Nevertheless, more than half reported positive impacts resulting from their SLC experience, as illustrated in table 6.3, and a considerable proportion of respondents reported that it was still too early to expect such impacts to be realised.

Impacts on:	All	Primary Teachers	Primary Coordinators	Heads of Science	Secondary Teachers	All Technicians
Schools & Colleagues Overall	64%	60%	72%	64%	57%	67%
Colleagues	56%	49%	69%	62%	53%	56%
Whole School Objectives	57%	61%	78%	60%	54%	44%
School Development Plans	53%	53%	75%	64%	53%	36%

As the table illustrates, Primary coordinators and Heads of Science in Secondary schools were the most likely to report positive impacts on their **schools and colleagues overall**, at 72% and 64% respectively. While this is to be expected given the roles of these individuals and their ability to influence change, positive impacts were also identified by over half of other teaching staff and over two thirds of technicians.

Similarly, impacts on **whole school objectives and on school development plans** were most frequently, but not exclusively, reported by Primary coordinators and Heads of Science. Primary coordinators were more likely to report positive impacts than Heads of Science in both areas (78% vs. 60% for whole school objectives, and 75% vs. 64% for school development plans). Primary coordinators were also slightly more likely to report impacts on whole school objectives compared to school development plans (78% vs. 75%), while the reverse was true for Heads of Science (60% vs. 64%).

Over half of all Primary and Secondary teachers also reported positive impacts in these areas. In the case of technicians, while over two thirds reported positive overall impacts, they reported impacts on whole school objectives and development plans least frequently (44% and 35% respectively).

A majority of educators (56%) reported positive impacts resulting for their **colleagues** as a result of their SLC provision, although Primary coordinators and Heads of Science were more likely to report such effects (69% and 62% respectively). Post-course

dissemination activities were reported by 82% of the respondents, and most commonly consisted of sharing learning and materials through informal discussions with colleagues and at regular team or departmental meetings. There were fewer examples of special sessions being arranged for this purpose. One explanation for the lower level of impact on colleagues may be that either the respondents had not sought to identify such impacts, or that they were yet to convert into observable effects. It also suggests that courses could do more to encourage and support the effective dissemination of learning on participants' return to school.

Wider School Impacts – Qualitative Examples

SLC provision is one of many inputs which can contribute towards the achievement of school development plans and strategies. While examples of such contribution were reported, there were also high expectations that additional benefits would be realised through ongoing activities.

Involvement with the SLC initiative was considered to have helped **raise the profile of science**, as the examples below illustrate:

"[SLC provision] has helped give science a higher profile with the children" – Primary Science Coordinator.

"We wanted to raise the science profile at school, the course directly impacted on that" – Primary Science Coordinator.

In many cases provision had the potential to **directly support school development plans**, as one Primary science coordinator described:

"It is helping raise the standards of teaching science, and that is part of our school development plan".

Elsewhere SLC provision was also positively **influencing the wider development agenda**, as one Secondary teacher described *"We are hoping that [SLC provision] will help us become a designated science college"*.

While fewer examples of **impacts on colleagues at school** were reported, several examples of efforts to share learning were described, including:

"At the staff meeting I was able to enthuse the staff and give them practical ideas, which impacts on the children".

"I gave a talk at the staff meeting, we discussed some stuff I had learned and I gave them some of the assessment sheets [from the course] which we now all use and follow up."

6.2.4 Impacts on the Culture of CPD – Local and National

Finally, the survey also examined educators' views of the impact of engagement with the SLC on the culture of science-specific CPD in their schools. Table 6.4 below shows just 19% of all respondents reported any positive impact.

Impacts on CPD culture:	All	Primary Teachers	Primary Coordinators	Heads of Science	Secondary Teachers	All Technicians
Yes	19%	18%	26%	18%	19%	18%
No	43%	44%	42%	61%	49%	30%
Not Sure	34%	35%	32%	19%	30%	47%

(Remainder of responses not applicable/not stated)

While perhaps unexpected, fewer positive responses were received for this area of impact, with over one third of respondents reporting that they were unsure whether there had been any effect or not. The qualitative follow-up interviews identified that respondents were not always clear what such effects might be, and how they would recognise them. Primary coordinators were the most positive in terms of the impact on CPD culture, with just over one in four (26%) considering there had been some form of cultural change in their school.

6.3 SLC Impacts – Findings from the Educational Impact Study

The quantitative survey identified the extent and range of the impacts of SLC provision as reported by participating educators. However, the Educational Impact Study used a longitudinal approach to explore the links between the observed SLC course provision and its impact on educators, schools and colleges and pupils and students. This also allowed the professional judgement of the study team to be applied in a way not possible with a more quantitative survey approach. The study included 14 interviews with Directors and other SLC staff, and the observation of 22 CPD sessions provided across the Regional and National Centres, covering a range of provision types and delivery modes. These were followed by a total of 30 visits to a sample of schools attending the observed CPD sessions to explore actual and potential impacts on classroom practice. These visits included classroom observation (where possible), interviews with educators and the review of materials produced following CPD sessions and other evidence of impact.

Although the sample size for this exercise was relatively small, the overall findings regarding the nature and extent of impacts resulting from SLC provision support those from the quantitative survey. As reported previously, the study concluded that the sessions observed were of a high quality, with provision well matched to the objectives and audience, and exemplified good practice in teaching and learning. The findings of the Educational Impact Study as they relate to SLC impacts are summarised below.

6.3.1 The Range of Impacts Achieved

The large majority of educators interviewed reported positively about the impact of the SLC provision on their teaching practice, and provided specific examples of how participation in SLC sessions had led to changes in the classroom. One educator summarised the views of many when stating that *“The course has had a significant and immediate impact on provision for science across the school.”* Illustrative examples of the different kinds of impact are shown below.

Examples of Impacts of SLC Provision

An FE College teacher described his attendance at a CPD session ‘Inspiring Post-16 Physics’ had impacted on his work. This included:

- The routine use of mini-whiteboards by students;
- The introduction of successful physics taster sessions for KS4 students;
- An INSET session for all science staff involving many new teaching materials; and
- The revision of schemes of work to incorporate new active approaches to teaching physics.

The participant said that he “*had been reminded of ideas [he] had previously forgotten and gained many new ideas from course tutors and participants.*” He described “*buzzing with excitement and enthusiasm following the CPD.*”

In a second example, a lesson was observed involving the direct use of techniques from a ‘Discovery Dog’ Primary investigation session. The observed session demonstrated that the teacher’s expertise in using the Discovery Dog approach was having an impact on the pupils’ motivation and interest in scientific investigation. The pupils were keen to discuss their ideas and gained in their understanding of factors linked to fair testing.

Finally, a senior technicians’ course had a direct impact on the work of a newly appointed colleague, who described feeling “*much more confident and better equipped to do the job*”, including:

- Carrying out risk assessments;
- Planning new resource management strategies;
- Working with teachers, for example suggesting experiments that could be carried out safely in a classroom rather than a laboratory; and
- Working with small groups of pupils across the age range.

In only three of the thirty schools visited was there no observable evidence of classroom change resulting from SLC provision. In one case, a technician considered that the benefits had resulted from meeting and exchanging ideas with colleagues during the course rather than the session itself, which was less directly linked to classroom change. In the other cases, both Primary coordinators, pressures from other commitments meant that change had not yet been implemented. This was due to their inability to find time to implement change: Secondary educators were generally more able to prioritise implementation. Staff time and turnover are both important factors influencing the impact of CPD sessions on management and leadership. Primary teachers were keen to implement what they had learnt, and were often frustrated by the lack of opportunity to do so.

The nature of the impact of provision and resulting changes in practice were clearly dependent on the objectives and intended learning outcomes of the specific course attended. However, they can be grouped under four headings, as shown below:

- **Gains in personal knowledge and understanding** – for example: improved confidence in teaching non-specialist subjects (Physics and A Level Chemistry for a marine biologist and an earth scientist respectively) and specific topic areas

(for example electro-magnetism); and improved knowledge of new areas of science and how science works.

- **Changes in pedagogy** – for example: the more constructive use of the internet to support learning; improvements in scientific enquiry and planning by children; and work with the geography department in one school on new units which cross subject boundaries.
- **Curriculum innovation** – for example: the integration of Learning Skills for Science (LSS) skills into a new federation science curriculum; the revision of schemes of work to include new resources and approaches to physics; and support for Astronomy as a new GCSE option.
- **Development of professional skills** – for example: an improved understanding of the role of Head of Science, including implementation of the Specialist School plan; improving the ability of a technician to actively help teachers and support new practical activities; and the ability to organise twilight staff meetings on scientific enquiry.

The sample of sessions observed was chosen to include examples of each of these four categories. It would be helpful if SLCs analysed their provision in a similar way, so as to develop an awareness of the profile of possible impact and the areas where they are best placed to bring about change.

The examples given above were based on the direct application of knowledge, techniques or specific skills explicitly linked to the SLC training received, and as such represented *first stage* impacts which may or may not be sustained in the longer term. Wider impacts on the classroom and pedagogy, professional development and on attitudes to CPD amongst the educators are described in more detail below.

6.3.2 *Impacts on the Classroom and Pedagogy*

Educators were asked to demonstrate how their classroom teaching (or support in the case of non-teaching staff) had changed following their SLC experiences, and how these changes had come about. A range of evidence was used to support these claims including classroom observations wherever possible, new teaching resources and lesson plans produced, or outcomes from a type of activity not previously used.

Evidenced impacts on classroom pedagogy included:

- Numerous examples of the introduction of ‘wow-factor’ activities to enliven the teaching of physics;
- Using stories as a starting point for investigative work;
- A greater focus on higher order learning skills, and the expectation that students will provide more reasoned answers to questions;
- Development and use of a new range of experiments which can be related to industrial contexts;
- Teaching assistants implementing LSS approaches with confidence in the classroom following SLC training;
- A Primary coordinator introducing photography and floor books to provide a visual record of children’s learning;

- The use of mini-whiteboards to encourage participation and risk taking by less confident AS level students;
- The introduction of discussions of ‘scientific’ statements with Year 10 pupils as part of a How Science Works programme;
- Encouraging students to verify rather than simply accepting points through the effective use of internet research; and
- Promoting the use of quiz boards by pupils as a fun way of reinforcing ideas about circuits.

While these changes in classroom practice were linked directly to the SLC experience, many required additional inputs and development by the educators themselves. In these cases, it was considered that they were more likely to lead to the sustained enhancement of the teachers’ repertoire and skills base, and as such represented longer term or *second stage* impacts.

In order to encourage these *second stage* impacts educators need to be encouraged to think about the next steps to be taken, and feel an obligation to implement what they have gained from CPD sessions. Those who had attended courses subject to an award or other incentive were more able to provide evidence of the impact on their practice.

6.3.3 **Impacts on Professional Development – Management and Leadership**

Much of the provision observed focused on specific topics and approaches, and sessions lasted a single day. Other courses focused specifically on developing educators’ wider professional skills, and were often longer or consisted of a number of linked sessions. These were considered to represent ‘continuous professional development’ as the learning outcomes generated were intended to support educators’ development throughout their careers. Most, but not all, of the courses observed of this nature took place at the National Centre.

Identifying and evidencing the impact of provision of this type is inherently more challenging, as the impacts relate less frequently to the direct application of new techniques or specific skills which can be more easily observed. Consequently the evidence base for these impacts relied on individuals’ perceptions of their own progress, corroborated where possible by other colleagues at their schools.

These extended courses were mainly targeted at Primary coordinators and Secondary subject leaders or those aspiring to these roles. The course objectives usually focused on the management of change and innovation in science teaching and learning. Three levels of impacts were often described which related to the time required for implementation, namely impacts on:

- **Organisation** – such as introducing new topics or approaches, which are relatively quick to achieve and straightforward to monitor. Most educators were able to provide examples in this area – for example the development of learning through scientific discovery in collaboration with the Creative Partnerships programme.
- **Leadership** – such as clarifying educators’ own ideas and those of others and presenting them in a way which leads to cohesion rather than conflict, which are more longer term impacts and more difficult to measure. Most of the educators

were able to demonstrate the acquisition or development of existing leadership skills, with one Head of Department describing carrying out a review of their Department with consultancy support. The resulting action plan had then been agreed with colleagues, with the group work forming part of his SLC provision being cited as being helpful in developing the skills required.

- **Intellectual development** – such as gaining new insights into the theory of effective science teaching, translating these into practice and sharing with others, which are career long and developmental impacts. Here none of the educators volunteered examples of impact in this area, which although seen as desirable was not considered central to their school roles. All recognised that the development of new skills could have a longer term impact, although they considered that the development of organisational and management skills effectively took precedence given the pressures of their day to day needs.

The educators attending management and leadership programmes indicated that while their SLC experience had been extremely valuable, it was only part of their overall professional development. Each described also participating in other professional development activities, including working with Secondary National Strategy consultants, initiatives from professional bodies and the learned societies, and a range of other influences. This suggested that the educators attending the provision observed were already engaged in their own professional development, and as such both valued and were more able to access CPD.

6.3.4 *Impacts on Other Educators*

The sharing of learning from individuals' CPD provision is an important way in which impacts can be maximised, although this is often not undertaken effectively, so reducing the potential for overall impact in schools. Around half of the educators interviewed reported being given the opportunity to provide feedback to their colleagues on their return to school, usually through staff meetings and during training days. Others reported exchanging information more informally with their colleagues, but having fewer opportunities to do so in a more structured and comprehensive manner.

The likelihood of dissemination activities taking place was found to be greatest when materials for direct use in the classroom were provided, or where schools had made a specific commitment to a particular project. Successes in this regard amongst the provision observed included:

- In Primary schools – the Discovery Dog investigation and Puppets courses – where dissemination was effective and led to implementation; and
- In Secondary schools – where the LSS and Supporting Physics Teaching for 11 to 14 year olds were also assimilated and implemented.

6.3.5 *Impacts on Attitudes to CPD*

The majority of the educators described their experiences of SLC provision positively, particularly regarding the quality of the inputs from leading professionals in science education and the expertise they offered. Those attending the National Centre spoke particularly highly of the two-block residential format, and more widely many participants considered that SLC provision had raised both the standard for CPD and their expectations for future provision.

Participants were also positive about the way in which the courses had been conducted to make them feel respected and valued as well informed and qualified professional scientists by both tutors and their peers. Non-teaching staff appreciated the way they were treated on their courses, with several commenting that “*at last we are getting some subject training*”, and suggesting that their expectations had been raised regarding further inputs in the future.

When professional self-perceptions were discussed, much debate resulted over whether the educators considered themselves to be teachers *and* scientists or teachers *of* science. Primary educators tended to characterise themselves as teachers with an enthusiasm for science, while Secondary educators were more likely to consider themselves to be both teachers and professional scientists. As one Secondary educator described: “*an effective science teacher must be an effective teacher with a love for science, ideally but not essentially with some industrial or scientific research experience.*” Although based on a small sample, this has implications for developments towards the recognition of professionalism and commitment to CPD as envisaged through initiatives such as the award of Chartered Science Teacher status.

6.4 Key Factors Influencing Impact

A series of key factors were identified in both the Early Impact Survey and Educational Impact Study which appeared to influence the likelihood of positive impacts resulting from SLC provision. In many cases these tallied with the findings of previous research into effective educator CPD, and represent good practice in this area.

6.4.1 The Early Impact Survey

As part of the quantitative survey a series of analyses were undertaken to establish links between the impacts reported and the factors contributing to their achievement. While variables such as the likelihood of recommending SLC provision to colleagues were closely linked to reported impact, other variables where strong positive correlations were identified included whether:

- The SLC had received and acted on pre-course information provided by educators about their expectations and reasons for attending;
- Post-course contact by the SLC had taken place and was considered useful;
- Educators had disseminated the learning and/or materials from their course amongst their colleagues at school; and
- Educators had received and completed any preparatory work provided by the Centre prior to attending their course.

In addition to these factors, other variables were also identified including:

- Whether the educator had attended the National or a Regional Centre – highlighting the differences in terms of the nature, longer duration of provision and degree of pre-planning between the National and Regional Centres’ offers;
- Whether educators discussed the outcomes of their course with their line managers on returning to school; and
- The type/seniority and length of teaching experience of the educators attending.

In many cases, these factors had been recognised by the Centres and featured, to differing degrees and consistencies, across their provision.

6.4.2 Educational Impact Study

The Educational Impact Study also identified a series of key influences on the achievement of positive impact, which included:

- A strong longitudinal component to provision;
- The use of pre- and post-course activities;
- Post-course follow-up by the Centres; and
- Identification of expected learning outcomes in advance of attending provision.

The study found, however, that no one model of course delivery was inherently better than another, and that the key to impact was the match between participants' needs, the course content and delivery model. Courses of a single day duration are equally capable of having a positive impact provided their specific objectives are appropriate, for example improving subject knowledge in a specific topic. However, the inclusion of pre- and post-course activities is likely to enhance and increase the likelihood of sustained impact.

7 CONCLUSIONS AND RECOMMENDATIONS

This Chapter presents the conclusions and recommendations of the evaluation, drawing upon the findings from each of the methodological components and of the Interim and individual component reports.

The conclusions include our assessment of the progress of the initiative towards the achievement of its short and medium term aims, and address the key aims of the study which were to assess the:

- Impact of the SLC initiative on school science educators;
- Impact of the initiative on pupils and students;
- Impact of the initiative on the culture, expectation and uptake of CPD amongst science educators; and
- Operation of the SLC Network – in terms of process effectiveness and contribution to impacts.

Our recommendations are provided in the context of ongoing progress with the new contractual arrangements for the provision of the SLC services, and set out the key areas and issues we believe should be considered as part of ongoing discussions with the Centres.

7.1 Conclusions

7.1.1 *Progress Towards the Aims of the Initiative*

The evaluation concludes that **good progress has been made towards the achievement of the short and medium term aims of the SLC initiative**. The National and Regional Centres are making a positive contribution to the enhancement of science educators' professional skills, which in turn are impacting on pupils' classroom experiences and learning.

In their first two academic years of operation, the National and Regional Centres have been successful in or made good progress towards:

- **Establishing themselves as operational entities** – including establishing the physical Centres (and in the case of the Regional Centres, a range of outreach locations), administrative systems and recruiting staffing complements;
- **Raising awareness of the initiative and the individual Centres** – utilising a range of mechanisms and increasingly through positive recommendations from the educators, schools and other organisations that engage with them;
- **Establishing the SLC Network** – moving from a starting point of ten independent Centres with a series of tensions militating against collaborative behaviour, to a Network characterised by high levels of commitment, collaboration and mutual benefit which is becoming greater than the sum of its parts;
- **Delivering, and establishing a reputation for, high quality CPD services which have the potential for impact** – with each Centre exceeding their

throughput targets in 2006/7, establishing a firm foundation to be built upon and impacting on educators and to a lesser extent their schools and students;

- **Establishing positive relationships with many local, regional and national stakeholders** – leading to shared understandings and collaborative working arrangements, with the SLCs being increasingly seen as valued partners; and
- **Finding the most appropriate ‘strategic fit’** for themselves, particularly at the regional level, and becoming embedded in both the national and regional science CPD infrastructure.

These achievements should be viewed in the context not only of the youth of the initiative, but the fundamental challenges it has faced from the outset. These included:

- **The lack of demand for science-specific CPD services** – with barriers to participation including: limited school and college budgets, with competing demands from the attainment and other whole school agendas; variable views of the importance of CPD amongst school decision makers; and educators’ own concerns over spending time away from the classroom. This represented a greater challenge than many of the Centres initially expected, and has influenced Centre staffing and the nature of provision offered.
- **Establishing a presence in a fragmented CPD marketplace** – the characteristics of which are variable across the regions and where engagement has needed to take place at the Local Authority level. The Centres have established many positive relationships across their Local Authorities, where the availability of science CPD may be highly variable, and the SNS consultants working with them. While the nature and coverage of these relationships is variable, and the Centres are aware of the remaining challenges, opportunities exist to extend these further. Some Centres have invested more resources than others in developing their local relationships, which in the majority of cases have led to considerable mutual benefit. Further development of collaborations should continue to be a priority for the Network.
- **Countering a series of negative initial perceptions of the initiative and of the Centres themselves** – with the establishment of local, regional and national relationships being initially hindered by concerns over competition between the Centres and existing CPD provision (both private and public sector), the duplication of services, and questions over the role, remit and value added of the Centres. The Centres have had to work hard to counter these concerns both locally and nationally, through actively demonstrating their intentions to work collaboratively to avoid duplication, identify where they can add most value, and work jointly towards a common goal.
- **Attempting to balance the initial vision of the initiative to “bring exciting contemporary science into the classroom”** with the demands of the marketplace and the need to become self-financing, and offering genuine CPD opportunities rather than just short term benefits. Here the nature of demand and the requirement to meet performance targets have influenced delivery models, particularly amongst the Regional Centres, and led to the majority of provision across the Network being short, single day courses. While such courses can, and are, producing impacts on their participants, the longitudinal, multi-day model followed by the NSLC appears more likely to lead to sustained impacts on educator professional development. Where the Centres have included pre- and post-course tasks/wrap-round elements to add longitudinal

element to their provision they influence educator impact, and more consistent use of such approaches would extend these impacts further.

While good progress has been made to move the initiative forward and address the challenges facing it, there remains much to be done before its short and medium term aims are achieved. We conclude that the development of partnership and collaborative arrangements established at the national and regional levels represent the way forward for the Network, supported by a clear and shared view across the Centres of their strategic purpose and uniqueness in comparison to other providers.

7.1.2 *The Impact of the SLC Initiative*

The study concludes that the SLCs are having **a positive impact on the educators they work with, their colleagues in schools and colleges and the pupils and students they teach**. Although data is not yet available to quantify these impacts across the Network as a whole, evidence from the educator survey and the observation and follow-up of a sample of provision suggests that:

- **Impacts on individual educators** were the most commonly identified, with the vast majority of respondents to the impact survey reporting positive impacts on:
 - Personal motivation – reported by over eight out of ten educators overall;
 - Subject knowledge – reported by almost eight out of ten educators; and
 - Confidence in the classroom – reported by almost six out of ten educators.

Primary educators were found to be more likely than their Secondary colleagues or technicians to report impacts on their motivation and confidence, while impacts of subject knowledge were strong across all educator groups.

The observation work, while based on a comparatively small sample, allowed these benefits to be explored in detail and their influence witnessed directly. Here gains in educators' personal knowledge and skills represented '*first stage*' impacts, which while valuable may not be sustained in the long term. '*Second stage*' impacts on pedagogy, management and leadership capabilities, and on longer term professional development were also identified. In these cases courses with a longitudinal component were found to be more likely to impact than single day provision.

- **Impacts in the classroom and on pupils** were frequently reported in the quantitative survey, with four out of five teachers reporting an impact in the classroom, and three quarters reporting impacts on their pupils' learning, interest, motivation and achievement. Technicians reported impacts in this area less frequently, as would be expected given the nature of their classroom role.

These impacts were underpinned through access to more engaging teaching resources, new lesson ideas and more hands-on practical sessions – with the provision of materials for direct use in the classroom being a commonly recognised benefit of SLC provision.

The observational study provided more specific examples of how SLC provision had influenced classroom teaching through the application of knowledge imparted and through the use of materials provided by or through the Centres.

These included impacts on pedagogy, which as '*second stage*' impacts were more likely to have a longer term influence. This also emphasised the value of encouraging educators to consider how they would implement the learning from their provision on their return to school.

- **Impacts on schools and other educators** were reported less frequently, but even so two thirds of survey respondents described an impact on their schools overall, with over half reporting specific impacts on their colleagues, whole school objectives and on school development plans. Primary coordinators and Heads of Science were the most likely to report these wider school impacts, as their role would suggest.

The dissemination of learning and materials gathered during SLC provision was widely described, most commonly through informal meetings with colleagues or during staff meetings. While much of this activity appears to have not yet converted into observable impacts, educators were frequently confident that such benefits would be realised over time.

The educators also commonly considered that further impacts were likely to result across other areas of influence from their involvement, but that these would take time to be realised. There is an important role for the Centres to play in ensuring that these potential benefits are achieved, through the provision of continued support to facilitate and embed change.

Achieving a noticeable impact on the wider **culture of science-specific CPD** is perhaps the greatest challenge facing the SLC initiative, with any step change being unlikely to be achieved by the SLCs alone. The latter stages of the study have, however, identified what appear positive indications in this area:

- **Locally/regionally** – with examples being offered by the Regional Centres and their local partners and stakeholders of the increased take-up of CPD opportunities by individual schools, suggesting that some positive change in attitude is emerging from the 'bottom up'. Similarly, the increased willingness of regional partners and stakeholders to engage with the initiative may also suggest a positive shift in CPD culture.
- **Nationally** – with the national stakeholders suggesting the beginnings of a shift in perceptions towards the importance of science-specific CPD, and increased acceptance of and engagement with the SLC initiative. However the question remains over whether the Centres are working with a sufficient number of educators and schools/colleges to positively influence CPD culture more widely.

At the individual level, evidence from observation and follow-up of SLC provision identified that attendance at the Centres had generally enhanced educators' views on the value of CPD. While not all saw science-specific CPD as integral to their careers, all described feeling valued as professionals in their dealings with the Centres which had often enhanced their professional self-esteem. The repeat of the baseline survey undertaken as part of this study will be able to identify whether the influences suggested can be identified more widely.

In conclusion, the SLC initiative and the individual Centres are having impacts on educators, pupils and their schools. While it was acknowledged by the funders that it may be too early for impacts to be realised and identified at this stage, we consider

that while a comprehensive assessment is not yet possible the key elements are in place for further positive impacts to result. The challenge for the Network is to extend the coverage of its influence by the scaling up of delivery, and taking further steps to ensure impacts result for participating schools and educators.

7.1.3 The Operation of the SLC Network – Process Effectiveness and Contribution to Impacts

As the Interim report described, the Centres were becoming recognised as the providers of high quality CPD provision, and were putting in place the necessary elements to lead to positive impact. This report has confirmed that the quality of provision through the sessions observed and in the view of partners, stakeholders and participants is high. Satisfaction with SLC provision amongst educators is also extremely high, where it is most commonly seen as better than or at least as good as what had been available previously.

The achievement of impact is also supported by the delivery models followed by the Centres. While no single model of provision was found to be inherently better than another in the context of their different objectives and intended learning outcomes, the inclusion of a longitudinal component was found to increase the likelihood of impact. While multiple day provision was more likely to impact positively, say, on management and leadership skills, single day sessions focusing on educators' subject knowledge could be equally effective in meeting the specific objectives set for them. In all cases, however, the likelihood of impact was increased when some form of longitudinal component was included – in the case of single day courses for example through the provision of pre- and post-course materials. While the Regional Centres were found to be including these in their course provision, they were used on a variable basis between different Centres and courses.

The Centres were given a considerable degree of latitude at the outset of the initiative to establish their delivery offers and processes to best fit the requirements of their customer bases. This has led to a variety of practice being followed, and the ability to be flexible particularly at the local level is widely appreciated by the majority of their local partners and stakeholders.

However, there are also areas where the introduction of more common approaches would be beneficial, including:

- The use of the SLC portal, which continues to be variable between the Centres and by educators accessing SLC services. The study has found that the portal can offer benefits to educators, and the portal and its benefits should become a more common and integrated element of course provision.
- The collection, analysis and reporting of management information – and the use of this information to underpin course development and provision. Here the wider use of the portal for administrative purposes was reported across the Centres, although its use for collecting and processing performance and management information remains variable.
- The development of course provision – where increased collaboration between the Centres would lead to benefits in terms of cost effectiveness and the utilisation of existing experience and expertise.

- The assessment of impact and common approaches to collecting data on customer satisfaction – with the Impact Framework having considerable potential to stimulate as well as identify impact, and to allow success to be reported on a comprehensive basis across the Network.

There remains a high level of course cancellation across the Network, over 50% of core programmes in some Centres, which is recognised by stakeholders both regionally and nationally. While many stakeholders acknowledge the challenges facing the Centres in scaling up delivery, the continued high level of cancellation has led some to question the effectiveness of SLC marketing and planning. While many Centres have reviewed their core programme offers in the light of local demand, it is disappointing that high levels of cancellation remain and we have provided recommendations to support course planning in future.

Finally, the ability of the Network to engage with national stakeholders, and deliver national provision, in a coordinated manner has been improved significantly by the appointment of the Network Project Director. However, the perception amongst some national stakeholders remains that the ability to respond is variable between individual Centres, where differences are perceived over the range of provision available and, in fewer cases, its quality and appropriateness.

7.1.4 The SLC Network

The establishment of a formalised SLC Network and the development of a single Network strategy represent a major success and provide a solid platform for further development. While still early days in the implementation of the Network strategy, this presents an opportunity to address many of the operational issues described above, develop common approaches and speak and act with a single voice.

The importance of the Network is also emphasised by the new contractual arrangements, which demand a more coherent approach and about which many questions of detail remain to be answered. These include the degree to which roles and responsibilities are centralised at the NSLC or distributed across the Regional Centres, and ensuring that resources are allocated to reflect this.

7.2 Recommendations

At the time of writing, the re-tendering exercise for the provision of regional Science Learning Centre services is continuing, although we understand that a preferred bidder has been decided on, and more detailed negotiations are taking place between DCSF and the individual Centres. While the content of these negotiations remains, quite correctly, confidential between the parties involved, our recommendations focus on what we consider to be the key issues for the further development and success of the initiative based on our experience of the National and Regional Centres during the period of the evaluation.

7.2.1 Strategic Recommendations/Recommendations for Funders and Policy Makers

- Build on successes in integrating SLC services with other wider local, regional and national partners, strategies and approaches – for example the successful relationships between some SLCs and local Secondary National Strategy staff.

- Directly involve the SLC Network in delivery of the commitments made in the Next Steps report towards raising the profile and priority of science-specific CPD in schools.
- Emphasise the role of the SLCs in supporting change in the culture of CPD generally in schools and influencing the demand side. Seek to secure ring-fenced CPD budgets for schools.
- Ensure that the SLC Network continues to be represented in policy discussions and is seen by policy makers as having a leading role in implementation.
- Continue to strengthen the close links between the SLCs and STEMNET, STEM Support Centres and the Regional STEM partnerships and communication managers.
- Establish closer relations between the SLCs and NCETM – with the NCETM Regional Coordinator being co-located at the Regional Centres – and support and develop and expand joint working, which has already begun in some of the regions.
- Establish a research and analysis team at the NSLC, to provide a central research capacity to specifically support the development and implementation of Network strategy. The principal function of this team would be to explore supply and demand issues to inform programme planning, and future SLC strategy, at national and regional levels. This would include the analysis of regional supply issues and gaps, research into competence requirements for science teachers, and exploring potential opportunities resulting from key national initiatives and programmes. In addition, the research and analysis team should:
 - Provide high-level analysis for the Network, based on data provided by the Centres via the SLC portal, to explore the take-up of SLC services, market penetration, and produce central and regional analysis and management information for the funders.
 - Undertake specific research into the demand for cutting edge science provision – its level, nature and potential customer base.
 - Identify any regions or areas with unique needs that the Network could help address – e.g. London, which has significantly higher numbers of teachers trained outside of the UK than other regions.
- Based on the research and analysis work above, the Regional and National Centres, with their national, regional and local partners, should identify a minimum CPD requirement for all science teachers. The Network should work with partners to ensure that provision to meet this requirement is available across the regions. Where existing, quality provision is in place the Centres should seek to promote rather than duplicate it – and where it is not should commission or develop additional provision to fill any gaps identified.

7.2.2 Performance Management

- As part of the implementation of the Network strategy, establish a broad yet rigorous set of key performance indicators (KPIs), which encapsulate the objectives of the initiative and drive their achievement. Potential KPIs are provided below.

Science Learning Centres Potential KPIs

For each of the 10 SLCs:

- Increase in throughput of 10% per year.
- Provision is rated as good or excellent by 95% of attendees.
- Provision is rated as meeting needs by 95% of attendees.
- Provision is rated as meeting the objectives set for it by 95% of attendees.
- 95% of attendees feel more effective/confident in the classroom after taking a course.
- 80% of attendees feel more motivated after taking a course.
- Each regional SLC and the NSLC has, or is able to refer to, courses that are recognised by science CPD professionals as covering the full 5–19 science curriculum and supporting whole school initiatives, such as Every Child Matters.
- 95% of provision is recognised by science CPD professionals as employing up-to-date training methods.
- Penetration – each SLC should provide CPD to 25 schools each year that have not been previous customers, until 2012 when the indicator will be reviewed.
- 90% of Secondary science teachers and Primary science coordinators are aware of the initiative by autumn 2009.
- An observable change in performance amongst pupils in science (e.g. SATs, GCSE predictors, etc.) for schools receiving bespoke SLC services.

For the Network:

- Be recognised by the majority of national stakeholders as providing a focus for CPD in England.

For funders:

- 80% of Secondary science teachers and Primary science coordinators report they would be able to attend a course if they wanted by autumn 2009.
- 80% of Heads recognise science specific CPD as important by autumn 2009.

- Ensure that these indicators can be collected, consolidated and analysed and reported through the portal to minimise effort in their production, and that the resulting data is used to formally review performance and enhance market intelligence both nationally and regionally.
- Implement a common approach to assessing impact across the Network:
 - Using the Impact Framework which has been piloted across the Network to both stimulate and capture impacts, following a wider trial which considers the process in its entirety.
 - Evaluating the approach, including the resources required to implement and particularly follow-up to ensure the process is manageable.
 - Recognising the Framework’s limitations – using the Framework to identify ‘potential impacts’, which could form a useful sample base for further investigation (and follow-up by the SLCs).
- Negotiate with OFSTED to include the impact of the SLC Network as part of the science subject inspection work as soon as possible.

7.2.3 For the SLC Network

Staffing

- Make the Network Project Director post permanent, with support staff posts being created to ensure continued success in bidding for Network projects and coordinating their delivery and the delivery of commissioned projects across the Centres.
- Explore the options for continuing and formalising the roles of the current Primary, Secondary and Post-16 'sector leads'. The Network must decide whether the sector leads should remain based in the Regional Centres (and if so provide financial and other resources to recognise their role) or whether posts should be established at the NSLC. Where existing sector leads wish to retain their roles, we recommend that they remain based in the Regional Centres, and be resourced on at least a part-time basis by the Network centrally.
- When recruiting new staff, consider making classroom experience a specific criteria in their selection, especially for front-facing staff.

Services/ Delivery

- The Network and the individual Centres should:
 - Use their enhanced intelligence capability from the proposed research and analysis team to map provision against the minimum science CPD requirement established earlier at the regional and local levels, working with regional bodies, Local Authorities and existing providers to identify current gaps and areas of new demand.
 - Establish registers of provision, based on this mapping exercise, allowing the Centres to provide a comprehensive referral function for educators seeking to access science CPD.
 - Ensure that they have the capacity to deliver their proposed services by reviewing the adequacy and sufficiency of their existing staffing complements and their skills and capability mixes.
- The Network should seek to extend the longitudinal elements of its provision as appropriate to the objectives and intended learning outcomes of individual courses. In the case of short courses this should include ensuring the use of pre- and post-course materials to facilitate impact, and offering linked or suites of provision to promote a more continuous approach to science educator CPD.

Marketing

- Continue to support the central marketing function to implement the Network Marketing Strategy – informed by additional research into demand and effective approaches.
- The strategy should continue to be implemented at the national and region levels, but delivered at the Local Authority level to take account of local differences in existing provision and where influence may be greatest.
- Ensure that marketing messages emphasise the direct teaching experience of staff in the Centres and its importance to the provision offered.

Partnership and Collaboration

- Continue and extend efforts to engage a broader range of local, regional and national stakeholders with the Network and SLC initiative more broadly, and to continue to embed into existing local/regional infrastructures, avoid duplication of effort and wasteful competition, and maximise added value.
- Ensure capacity is in place to work with national partners and stakeholders, and develop a means of categorising potential partners and appropriate strategies for engagement. This should involve identifying key influencers, and what respective contributions might be.
- Establish an annual SLC national conference, taking place at the NSLC in York, to provide an update on the progress of the initiative for national and regional partners and stakeholders. In addition, consider the options for offering the NSLC, and the other Regional Centres whose premises allow, as venues for the national ASE conference.
- Seek to strengthen the Network's corporate relationships and links at the national and regional levels in a coordinated manner, starting with national links at the headquarters level and regional links at the site level.

The SLC Portal

- The funders should commission an independent, external review of the SLC portal to establish the specific requirements of the Centres, and how these can best be met. This would include ensuring that the portal can be used to collect common monitoring variables and KPIs for the funders, as well as providing data on educator use to feed higher level analyses.
- In addition, the exchange of experience between the Network and the NCETM should be encouraged to identify successes, challenges and good practice, in providing portal-based approaches to CPD.
- Following the completion of the review and the implementation of the resulting recommendations, take steps to ensure that the portal is used on a more consistent basis across the Network. The promotion of shared ownership across the Centres is the most positive strategy to support this, and providing a clear statement on the 'ownership' of educator data provided by the Regional Centres may also be helpful. The Centres should be strongly encouraged to use the portal, and if possible incentivised, to collect and report management information. This could include only allowing DCSF educator days to be counted if they are recorded on the portal.
- Take steps to extend the use of the SLC portal by:
 - Ensuring that the portal is introduced as part of every SLC course – and that all outreach venues have appropriate internet access.
 - Making it a condition of contract that all external providers provide course materials to be posted on the portal, and introduce (or at least make reference to) the portal in each SLC session they deliver.
 - Give educators attending SLC provision a reason to visit the portal after their provision – such as post-course tasks, etc. – and develop materials that illustrate the benefits of its use as a resource bank to stimulate initial interest.

- Develop guidance materials on the use of the portal and its benefits for educators to take away after courses, or which can be provided in electronic form with enquiries and when new educators register with it.
- Exploring options for including additional and innovative services for educators – such as the use of video files and podcasts, with development work being funded by the Network.

ANNEX I – STUDY METHODOLOGY

Study Methodology

The study featured a combination of quantitative and qualitative approaches, and was structured into four Components as follows:

- Component A – Scoping and Initial Evaluation Study (*May to September 2006*);
- Component B – Initial Survey of Science Educators/Interviews with Educators Not Using SLC Services (*July to December 2006*);
- Component C – Educational Impact Study (*June 2006 to July 2007*); and
- Component D – Early Impact Study (*September to December 2007*)

Individual reports were produced for each study Component, which were consolidated in an Interim report (submitted in September 2006) and the final report.

The four Components, and their constituent tasks, combined to address the objectives and the four key elements of the evaluation, namely:

- Element 1 – Impact on school science educators;
- Element 2 – Impact on pupils and students;
- Element 3 – Operation of the SLC Network – in terms of effectiveness of processes and contribution to impacts; and
- Element 4 – Impact on culture, expectation and uptake of continuing professional development.

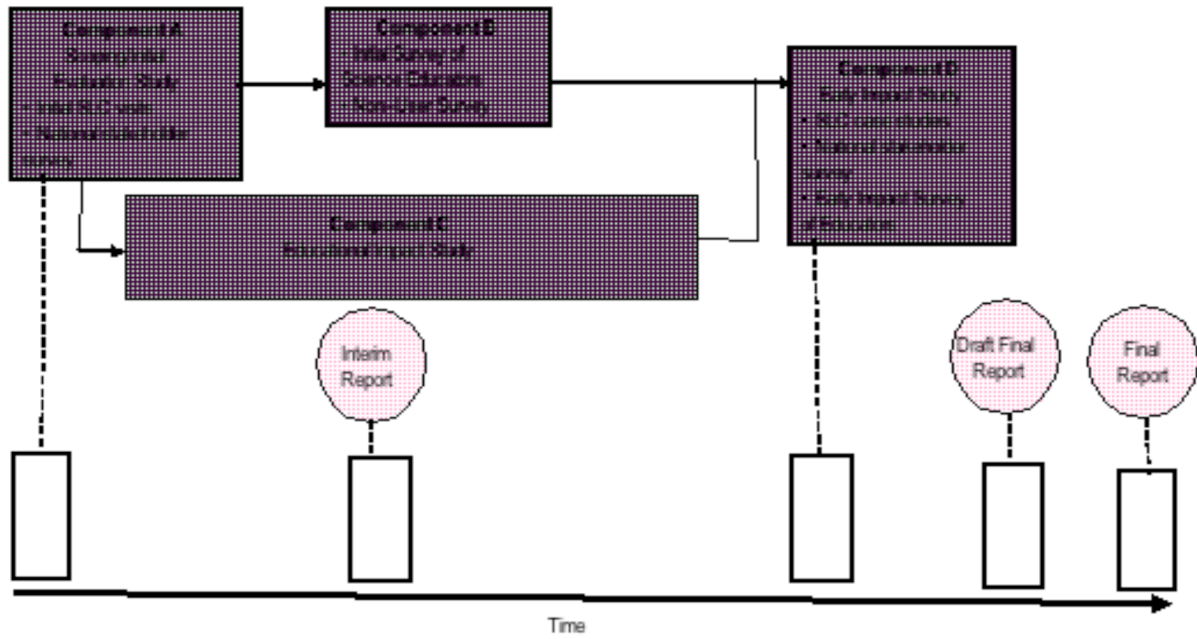
The contribution of each Component to addressing the specific study elements is summarised in the table below, which featured in the initial study proposal.

Evaluation Component	Study Element
Component A – Scoping and initial evaluation study	Element 3 – Operation of the Network
Component B – Baseline study of science educators	Element 1 – Impact on science educators
Component C – Educational impact study	Element 2 – Impact on pupils and students
Component D – Early impact study	Element 1 – Impact on science educators Element 3 – Operation of the Network Element 4 – Impact on culture, expectation and uptake of CPD

However, the requirement for early information on the emerging impact of the initiative meant that Component A had an enhanced evaluative component, and so contributed to the initial assessment of all four study elements.

The four Components, and their constituent tasks, are summarised in the figure below before being described in more detail. Full methodological appendices are also included in the individual Component reports.

Summary Schematic of Study Methodology



1 Component A – Scoping and Initial Evaluation Study

This Component was delivered between May and September 2006, and was initially intended to be the scoping and familiarisation stage of the study. However, the requirement for an initial assessment of emerging impact, and the likelihood of impact being achieved, meant that the Component was extended to include discussions with users of SLC services and interviews with regional partners and stakeholders. The initial stage of Component C was also brought forward, as discussed below.

Component A consisted of three main tasks:

- **Initial desk research** – featuring the review of SLC strategic and operational documentation (including annual reports and delivery plans for each Centre), and recent research of relevance to the SLC initiative.
- **Initial visits to each of the nine Regional Centres and the National Centre** – featuring consultations with SLC staff, and a sample of partners and stakeholders for each Regional Centre. This task also included telephone interviews with 32 educators using SLC services, to identify their experiences and whether any impact had resulted from them.
- **Consultations with a range of national stakeholders** – to explore their perceptions of and engagement with the initiative, and to act as a ‘baseline’ for the follow-up interviews under Component D.

The findings from the Scoping and Initial Evaluation Component, with the early findings from Component C, formed the evidence base for the Interim report, which was submitted in September 2006.

2 Component B – Initial Survey of Science Educators/Interviews with Educators Not Using SLC Services

This Component was delivered between July and December 2006, and featured a telephone survey of 1,400 educators (to explore their experience of science-specific CPD and to provide a baseline for subsequent follow-up) and a smaller survey of 100 educators showing an interest in SLC services but yet to participate in them. Each task is described in detail below.

B1 Initial Survey of Science Educators

This survey comprised telephone interviews with 1,400 educators across England, Wales, Scotland and Northern Ireland, and aimed to explore their attitudes towards and experience of science-specific CPD, and their awareness, perceptions and engagement with the SLC initiative. The survey also provided a ‘baseline’ of participation in and attitudes towards science-specific CPD amongst science educators, and against which the progress of the initiative could be assessed in future.

Task 1: Sampling

The population to be sampled was all science educators in the UK – and included all teaching staff in Primary schools and all science teachers including heads of science in

Secondary schools, sixth form colleges and institutions of further education. It also includes all science technicians working in the Secondary and further education sectors. However, individual contact details for teachers are not available, and so the sample was composed of schools drawn from government databases maintained by the departments responsible for education in each of the four countries in the UK.

As there is no comprehensive source of names of science educators, a sample of establishments was drawn on and then an individual respondent from a pre-assigned educator type was selected from a given school. We used Edubase as our sample source for educational establishments in England. In Wales, Northern Ireland and Scotland we contacted the departments responsible for education who supplied up-to-date counts and contacts details of all establishments.

Sampling schools was a three step process. Firstly we stratified the schools by country and type (Primary, Secondary, sixth form, and further education). Then we determined the sample interval to provide us with a randomly selected '1 in n' sample proportionate to the population. And finally we drew a sample of two times the required number of interviews.

Task 2: Questionnaire Design

The study team identified the topics to be covered in the survey, and agreed this with the Wellcome Trust and the (then) Department for Education and Skills. A draft version of the questionnaire was developed and circulated for comment. It was subsequently finalised and piloted.

The piloting of the questionnaire was undertaken by a small team of TNS interviewers. Twenty interviews were conducted and analysed by the TNS researchers, with a number of suggestions and recommendations for a re-drafted questionnaire to improve clarity and understanding being presented and agreed.

The following topics were covered in the questionnaire:

- Current uptake of, experience of, and satisfaction with subject focused CPD;
- Attitudes to CPD, and barriers to participation;
- Perceived impact of CPD;
- Awareness and knowledge of SLCs;
- Participation to date in SLCs; and
- Interest in SLCs.

Most of the questions were pre-coded with a small number of open-ended questions. The questionnaire also contained a number of filtered questions which were only asked to either teachers or technicians.

Task 3: Main Fieldwork

The survey was conducted using a Computer Assisted Telephone Interviewing (CATI) system. The system software manages the sample (contact details), appointments, callbacks, refusals, open-ends and management reporting.

The positioning of the survey was important and so we interviewers were thoroughly briefed on the importance of the school taking part. A fax was produced which explained the background to the study and encouraged educators to respond.

A total of 1,430 interviews were conducted between 11th September and 8th November 2006. The overall response rate for educational establishments was 54%.

Task 4: Weighting and Analysis

Weighted data was produced to allow comparisons to be made across respondent types. The weighted data was produced by grossing up the achieved interview numbers in each respondent type within each country to the size of the estimated population. The impact of weighting is to very substantially increase the weight given to the responses from teachers in Primary schools. As this group is not the main target for attending the Science Learning Centres, care needs to be taken in assessing the results where all science educators are included. The main purpose of weighting in this report has therefore been confined to making comparisons with all science educators in England and those not in England. The sample sizes for non-England are too small to allow robust comparisons of any subgroups.

Cross-tabulations were produced to show the distribution of responses to each question and which informed the survey report. In brief, the cross-analyses focus on: educator type, establishment type, awareness of the SLCs, attendance at an SLC, and England/Non-England regions.

Further multivariate analysis was conducted which allowed respondents to be grouped according to their attitudes to certain statements. This included both factor and cluster analyses which explain the different attitudes and the characteristics of each group. The technical details of the factor and cluster analysis are discussed in the full report of the survey.

B2 Survey of Educators Not Using SLC Services

To identify any barriers to participation in the SLC initiative, 100 telephone interviews of 20 to 30 minute duration were undertaken with educators in schools and colleges who have not received SLC course provision. The 'non-user' interviews focused on educators who had shown an interest in the SLC Network, but were yet to engage with course provision. The key sub-tasks undertaken are described below.

Task 1: Development of Research Tools

A questionnaire was developed and agreed with the study steering group, with the topics covered including:

- The training received by the respondent in the previous academic year, the perceived importance of training and CPD to both the educator and the establishment in which they operate, and the key factors influencing decision making around training and development activities.
- The respondent's perceptions of the SLC initiative, including their views on quality, range and relevance of SLC provision, reasons for not making use of their services, and what might encourage them to use SLC services in future.

Task 2: Sample Development

The educator samples were developed as follows:

- Data from the portal was downloaded on 31st October 2006, to show individual registrations and whether or not they had participated in SLC services. Samples of educators in each region were developed, and broad quotas established for interviews by region and educator types.
- To reduce the risk of contacting educators recently participating in SLC activities, the regional samples were sent to each Centre for review and amendment as necessary. Each educator was also questioned on any involvement with SLCs in the screening section of the survey questionnaire.

Task 3: Telephone Interviews with Non-Participants

The 100 telephone interviews took place between November 2006 and January 2007, with quotas being established for their distribution by educator type to reflect the composition of the initial sample. The final achieved interviews were broadly in line with the quotas set, and offered a good mix of educators as shown below:

- 11 Primary science teachers and 14 Primary science coordinators.
- 37 Secondary science teachers, 21 Secondary heads of science and 11 technicians in Secondary schools.
- Five teachers and one technician in FE/sixth form colleges.

The participating educators were distributed across the nine English regions, again to reflect the share of non-participating educators in the initial sample.

Task 4: Reporting

The findings from the interviews with non-users were in a report of survey submitted on 31st January 2007.

3 Component C – Educational Impact Study

The Educational Impact Study involved the longitudinal tracking of service use to changes in classroom practice, and featured a series of observational case studies with a sample of schools and colleges. This component had five objectives:

- To evaluate the match between SLC products and the declared educational aims of the Network.
- To determine the extent to which SLC products are designed and delivered so as to maximise the impact on practice in schools and colleges.
- To identify and, wherever possible, evaluate probable causal connections between the response to SLC products and changes in practice.
- To evaluate the effect of different models of provision and management on the impact of CPD and other products.
- To evaluate the overall impact of the Network on the received science curriculum in schools and colleges and on classroom practice.

The study took place between June 2006 and July 2007, and allowed specific SLC products and services to be identified where the resulting impacts are most likely to

lead to observable changes in teaching practice. However, to allow for early findings to inform the Interim report in September 2006, an initial assessment exercise was undertaken with four SLCs and four educators in the Summer term.

Task 1: Development of Research Tools

A series of research tools were developed for each stage of the Educational Impact Study, with each member of the team contributing to their development before their sign-off by the client. Research tools were developed to include checklists/aides-memoir for each stage of the fieldwork and for use in Centre visits, discussions with participants and schools and lesson observations.

Task 2: Sample Development

Although the core activity of the Regional SLCs remains training through short courses, a range of product and delivery models are employed and a wide range of topics covered, ranging from changes in curriculum structures to the more creative and frontier science.

The sample of courses to be observed was designed to cover the range of product types, topics and users (e.g. teachers, technicians, individuals with management responsibilities, etc.), as well as coverage across the nine Regional and the National Centres. Consideration was also given to exploring novel products, where more conventional approaches are being examined elsewhere.

Information collected in the Scoping and Initial Evaluation Study on the products available from each SLC was shared to inform the sample of products to be examined in the main stage of the study.

Task 3: Visits to SLCs, Schools and Colleges

The fieldwork stage comprised a series of observational case studies, which were longitudinal and allowed both product and participating staff to be tracked from Centres to schools, and into the classroom in order to best assess impact.

Each Centre was visited to observe delivery of training and scrutinise supporting materials – with a strong focus on the likely impact of SLC products – following which 30 visits to a sample of schools and colleges were undertaken.

Visits to SLCs

The first visits to the SLCs were for a full day and included:

- Interviews with Centre Directors, programme coordinators, trainers and a brief discussion with participating educators; and
- Observation of 22 taught sessions across the Regional and National Centres.

Subsequent visit(s) focused on specific activities to cover the selected sample of SLC products, undertaken on a combination of single day and two half day visits according to timetabling and interviewee availability.

Visits to Schools and Colleges

School visits included:

- Interviews with CPD coordinators, Heads of Science/Subject Coordinators and participating educators;
- Scrutiny of materials such as course notes, follow up materials, in school tasks and any resulting product such as new scheme of work, school produced resource etc; and
- Observation of session or activity – selected by the participating educator as most likely to show the impact of SLC provision. This will clearly require advance contact with the school and individual.

Subsequent visits (typically two half-day visits or one full-day visit) will be arranged wherever possible to enable observations to be well matched to lessons or other activities most likely to yield evidence of impact.

Task 4: Reporting

The report of the Educational Impact Study was submitted in August 2007.

4 Component D – Early Impact Study

This final Component was undertaken between September and December 2007, and comprised three tasks:

- The Early Impact Survey – a postal survey of 5,000 educators to explore their experiences of and satisfaction with SLC services, and the impacts resulting from them. This task also included follow-up telephone interviews with 63 respondents, to explore their experiences in more detail.
- Second visits to the Regional and National Centres – including interviews with Centre staff, and a range of local/regional partners and stakeholders.
- Follow-up interviews with the national stakeholders – to explore any changes in perception and engagement since the initial interviews.

The methodology followed for each task is summarised below.

D1 The Early Impact Survey

This task comprised a postal survey of 5,000 educators who have used SLC services, to explore their experiences of and satisfaction with SLC services and identify the impacts resulting from them. This task also included follow-up telephone interviews with 63 survey respondents, to explore their experiences in more detail.

Task 1: Questionnaire Design

The study team identified the topics to be covered in the survey, and agreed this with the Wellcome Trust and the DCSF. A draft version of the questionnaire was developed and circulated for comment prior to piloting.

A small team of TNS interviewers carried out a cognitive pilot of the questionnaire prior to the main quantitative postal survey. Twenty interviews were conducted and analysed by TNS researchers. Interviews were carried out by telephone after a copy of the questionnaire had been posted to and completed by a small number of SLC users selected for the pilot exercise. Following the pilot a number of suggestions and recommendations for a re-drafted questionnaire were made to improve clarity and understanding.

Task 2: Questionnaire

The final questionnaire covered the following topics:

- Experiences of and satisfaction with SLC services – for example, content, level, delivery;
- Practical application to learning experiences in the classroom;
- Impact on confidence to deliver high quality science teaching;
- Impact on ability to deliver high quality science teaching;
- Strengths and weaknesses of experience; suggestions for improvements;
- Perceived value of the learning experience;
- Interest in attending further SLC learning; and
- Willingness to recommend the experience to others.

Most of the questions were pre-coded, although there were a small number of open-ended questions. The questionnaire also contained a number of filtered questions which were only asked to either teachers or technicians.

Task 3: Sample Development

The sample comprised 5,000 SLC users who had attended one of the ten SLCs between September 2006 and May 2007, and was supplied using a combination of information taken from the SLC portal and data files held locally by the SLCs themselves. Wherever possible, the sample design included 500 SLC users for each of the Centres, selected randomly within each Centre to ensure a spread of interviews was achieved with different types of SLC users. Several of the SLCs were unable to provide 500 records – to compensate for this those SLCs where there were sufficient records were slightly over-sampled to ensure an overall sample of 5,000.

Task 4: Fieldwork

The main quantitative survey was conducted by means of a self-completion postal survey sent to recent attendees. The fieldwork ran between 17th September and 2nd November.

A reminder letter was sent two weeks after the original, to all those who had not yet returned a completed survey (approximately 4,500 letters) with a new date for completion. A third reminder, this time with a second copy of the questionnaire, was sent at the end of October 2007 to just over 4,300 non-responders. Email reminders were also sent where possible.

During the survey period Royal Mail launched a two week postal strike, delaying both the sending and receiving of questionnaires to and from the SLC users. We believe this had an overall effect on the numbers of responses and contributed to a delay in the fieldwork period. Also for most schools in England and Wales, the Autumn half-term holiday fell during the fieldwork period. This also contributed to a further delay in responses, as questionnaires sent to school addresses were not completed until SLC users returned to school.

Despite the difficulties encountered during fieldwork, a total of 893 postal questionnaires were completed. This is a response rate of 18%; while a relatively low response, each SLC is represented in the survey data, as are teachers from both Primary and Secondary education. Very few SLC users worked in Further Education and consequently we were unable to comment on SLC impact in this sector.

Task 5: Analysis

A series of cross-tabulations were produced, which show the distribution of responses to each question.

Task 6: Reporting

The report of the survey, including the findings from the in-depth telephone interviews below, was submitted in December 2007.

In-Depth Follow-Up Telephone Interviews

In addition to the main survey, qualitative in-depth interviews were conducted with 63 SLC users from the main survey who agreed to be re-contacted. The interviews were conducted by a small team of TNS telephone qualitative interviewers, and were of approximately 15 minutes duration. The interviews took place between 12th and 27th November 2007.

Task 1: Sample

The postal survey asked SLC users to indicate whether they agreed to being re-contacted for further research on this topic. In total, 217 SLC users indicated their willingness to be re-contacted (a response rate of 24%). Hard quotas were not set on this sample because of the small numbers willing to be re-contacted although soft quotas ensured a spread of teacher types and different SLCs were represented.

Task 2: Topic Guide Design

A topic guide was designed in collaboration with the Wellcome Trust and DCSF. The aim was to explore in more detail aspects of the postal survey such as elements of satisfaction with the course and levels of impact the training has had on SLC users.

The guide consisted of approximately 30 questions, around half of which were open responses. Where possible, data from the postal survey was used to pre-populate the responses to the telephone survey to try and minimise the interview length. The interviewers were specialist qualitative interviewers who are specifically trained to probe SLC users for a more detailed response at particular questions.

Task 3: Analysis

SLC users' verbatim comments have been used where appropriate throughout the main survey report to support and illustrate findings from the main quantitative survey.

D2 Second Visits to the Regional and National Centres

This task comprised return visits to each of the nine Regional Centres and the National Centre, and took place between September and December 2007. The visits again featured consultations with SLC Directors and key staff, and interviews with a wider sample of partners and stakeholders.

The visits focused on:

- Reviewing progress and developments over the last year of operation;
- Identifying the impact of SLC provision – actual and expected;
- The extent to which the SLC delivery models had, or were likely to contribute to, impact; and
- The effectiveness of the operational models, and progress made in identifying the challenges identified in the Interim report.

Interviews with local partners and stakeholders included a range of local and regional agencies, and explored the degree of collaborative activity taking place, individuals' views on the Centres and the initiative more broadly, and on their impact to date.

D3 Follow-Up Contacts with National Stakeholders

In all but two cases, the same group of stakeholders were re-contacted towards the end of the study to discuss their views of and involvement with the initiative and the SLC Network. The interviews took place in September and October 2007, with the individuals contacted appearing as Annex II below.

The follow-up interviews allowed change in individual perceptions to be identified, as the initiative has progressed.

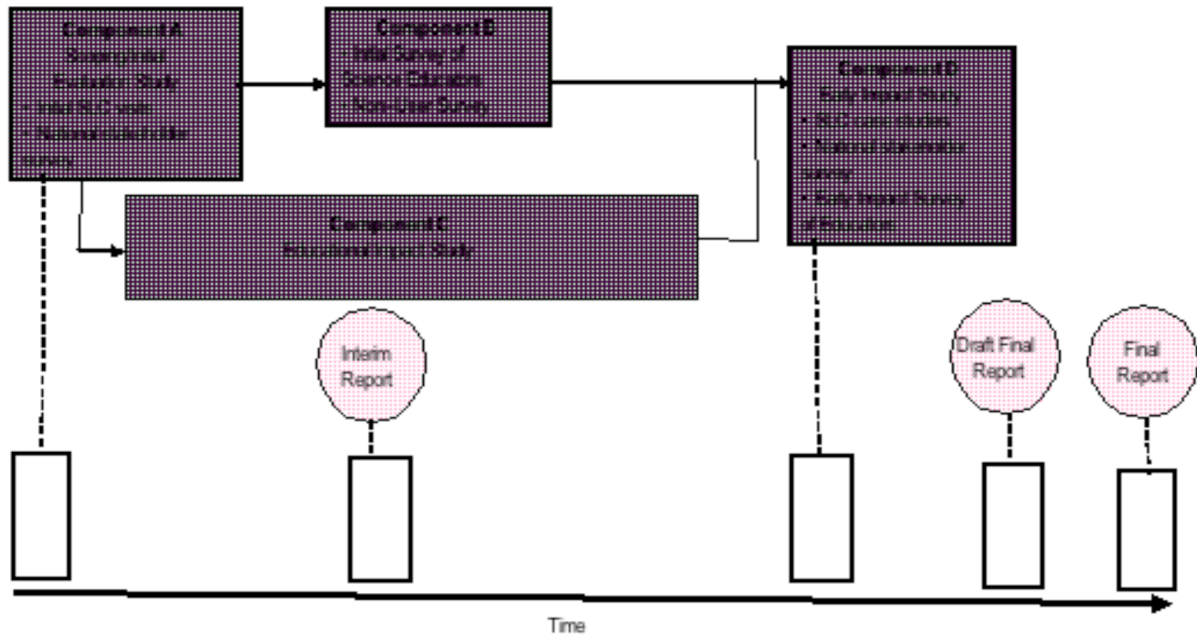
ANNEX II – NATIONAL STAKEHOLDERS INTERVIEWED

The national stakeholders interviewed were as follows:

1. Association for Science Education
2. AstraZeneca Science Teaching Trust
3. CLEAPPS (Consortium of Local Education Authorities for the Provision of Science Services)
4. Engineering and Technology Board
5. Futurelab
6. Institute of Physics
7. National Advisors & Inspectors Group for Science (NAIGS)
8. Nuffield Curriculum Centre
9. Ofsted
10. RCUK (Research Councils of the United Kingdom)
11. Secondary National Strategy
12. SETNET
13. Specialist Schools and Academies Trust
14. Qualifications and Curriculum Authority
15. Royal Academy of Engineering
16. The British Association for the Advancement of Science
17. The Royal Society
18. The Royal Society of Chemistry
19. The Science Council
20. Training and Development Agency for Schools
21. Department of Education in Northern Ireland
22. National Assembly of Wales
23. Scottish Executive
24. 1 pharmaceutical company
25. 1 physical sciences company

26. 1 ICT company

Summary Schematic of Study Methodology



1 Component A – Scoping and Initial Evaluation Study

This Component was delivered between May and September 2006, and was initially intended to be the scoping and familiarisation stage of the study. However, the requirement for an initial assessment of emerging impact, and the likelihood of impact being achieved, meant that the Component was extended to include discussions with users of SLC services and interviews with regional partners and stakeholders. The initial stage of Component C was also brought forward, as discussed below.

Component A consisted of three main tasks:

- **Initial desk research** – featuring the review of SLC strategic and operational documentation (including annual reports and delivery plans for each Centre), and recent research of relevance to the SLC initiative.
- **Initial visits to each of the nine Regional Centres and the National Centre** – featuring consultations with SLC staff, and a sample of partners and stakeholders for each Regional Centre. This task also included telephone interviews with 32 educators using SLC services, to identify their experiences and whether any impact had resulted from them.
- **Consultations with a range of national stakeholders** – to explore their perceptions of and engagement with the initiative, and to act as a ‘baseline’ for the follow-up interviews under Component D.

The findings from the Scoping and Initial Evaluation Component, with the early findings from Component C, formed the evidence base for the Interim report, which was submitted in September 2006.

2 Component B – Initial Survey of Science Educators/Interviews with Educators Not Using SLC Services

This Component was delivered between July and December 2006, and featured a telephone survey of 1,400 educators (to explore their experience of science-specific CPD and to provide a baseline for subsequent follow-up) and a smaller survey of 100 educators showing an interest in SLC services but yet to participate in them. Each task is described in detail below.

B1 Initial Survey of Science Educators

This survey comprised telephone interviews with 1,400 educators across England, Wales, Scotland and Northern Ireland, and aimed to explore their attitudes towards and experience of science-specific CPD, and their awareness, perceptions and engagement with the SLC initiative. The survey also provided a ‘baseline’ of participation in and attitudes towards science-specific CPD amongst science educators, and against which the progress of the initiative could be assessed in future.

Task 1: Sampling

The population to be sampled was all science educators in the UK – and included all teaching staff in Primary schools and all science teachers including heads of science in

Secondary schools, sixth form colleges and institutions of further education. It also includes all science technicians working in the Secondary and further education sectors. However, individual contact details for teachers are not available, and so the sample was composed of schools drawn from government databases maintained by the departments responsible for education in each of the four countries in the UK.

As there is no comprehensive source of names of science educators, a sample of establishments was drawn on and then an individual respondent from a pre-assigned educator type was selected from a given school. We used Edubase as our sample source for educational establishments in England. In Wales, Northern Ireland and Scotland we contacted the departments responsible for education who supplied up-to-date counts and contacts details of all establishments.

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Task 2: Questionnaire Design

The study team identified the topics to be covered in the survey, and agreed this with the Wellcome Trust and the (then) Department for Education and Skills. A draft version of the questionnaire was developed and circulated for comment. It was subsequently finalised and piloted.

The piloting of the questionnaire was undertaken by a small team of TNS interviewers. Twenty interviews were conducted and analysed by the TNS researchers, with a number of suggestions and recommendations for a re-drafted questionnaire to improve clarity and understanding being presented and agreed.

The following topics were covered in the questionnaire:

- Current uptake of, experience of, and satisfaction with subject focused CPD;
- Attitudes to CPD, and barriers to participation;
- Perceived impact of CPD;
- Awareness and knowledge of SLCs;
- Participation to date in SLCs; and
- Interest in SLCs.

Most of the questions were pre-coded with a small number of open-ended questions. The questionnaire also contained a number of filtered questions which were only asked to either teachers or technicians.

Task 3: Main Fieldwork

The survey was conducted using a Computer Assisted Telephone Interviewing (CATI) system. The system software manages the sample (contact details), appointments, callbacks, refusals, open-ends and management reporting.

The positioning of the survey was important and so we interviewers were thoroughly briefed on the importance of the school taking part. A fax was produced which explained the background to the study and encouraged educators to respond.

A total of 1,430 interviews were conducted between 11th September and 8th November 2006. The overall response rate for educational establishments was 54%.

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Weighted data was produced to allow comparisons to be made across respondent types. The weighted data was produced by grossing up the achieved interview numbers in each respondent type within each country to the size of the estimated population. The impact of weighting is to very substantially increase the weight given to the responses from teachers in Primary schools. As this group is not the main target for attending the Science Learning Centres, care needs to be taken in assessing the results where all science educators are included. The main purpose of weighting in this report has therefore been confined to making comparisons with all science educators in England and those not in England. The sample sizes for non-England are too small to allow robust comparisons of any subgroups.

Cross-tabulations were produced to show the distribution of responses to each question and which informed the survey report. In brief, the cross-analyses focus on: educator type, establishment type, awareness of the SLCs, attendance at an SLC, and England/Non-England regions.

Further multivariate analysis was conducted which allowed respondents to be grouped according to their attitudes to certain statements. This included both factor and cluster analyses which explain the different attitudes and the characteristics of each group. The technical details of the factor and cluster analysis are discussed in the full report of the survey.

B2 Survey of Educators Not Using SLC Services

To identify any barriers to participation in the SLC initiative, 100 telephone interviews of 20 to 30 minute duration were undertaken with educators in schools and colleges who have not received SLC course provision. The 'non-user' interviews focused on educators who had shown an interest in the SLC Network, but were yet to engage with course provision. The key sub-tasks undertaken are described below.

Task 1: Development of Research Tools

A questionnaire was developed and agreed with the study steering group, with the topics covered including:

- The training received by the respondent in the previous academic year, the perceived importance of training and CPD to both the educator and the establishment in which they operate, and the key factors influencing decision making around training and development activities.
- The respondent's perceptions of the SLC initiative, including their views on quality, range and relevance of SLC provision, reasons for not making use of their services, and what might encourage them to use SLC services in future.

Task 2: Sample Development

The educator samples were developed as follows:

- Data from the portal was downloaded on 31st October 2006, to show individual registrations and whether or not they had participated in SLC services. Samples of educators in each region were developed, and broad quotas established for interviews by region and educator types.
- To reduce the risk of contacting educators recently participating in SLC activities, the regional samples were sent to each Centre for review and amendment as necessary. Each educator was also questioned on any involvement with SLCs in the screening section of the survey questionnaire.

Task 3: Telephone Interviews with Non-Participants

The 100 telephone interviews took place between November 2006 and January 2007, with quotas being established for their distribution by educator type to reflect the composition of the initial sample. The final achieved interviews were broadly in line with the quotas set, and offered a good mix of educators as shown below:

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- 37 Secondary science teachers, 21 Secondary heads of science and 11 technicians in Secondary schools.
- Five teachers and one technician in FE/sixth form colleges.

The participating educators were distributed across the nine English regions, again to reflect the share of non-participating educators in the initial sample.

Task 4: Reporting

The findings from the interviews with non-users were in a report of survey submitted on 31st January 2007.

3 Component C – Educational Impact Study

The Educational Impact Study involved the longitudinal tracking of service use to changes in classroom practice, and featured a series of observational case studies with a sample of schools and colleges. This component had five objectives:

- To evaluate the match between SLC products and the declared educational aims of the Network.
- To determine the extent to which SLC products are designed and delivered so as to maximise the impact on practice in schools and colleges.
- To identify and, wherever possible, evaluate probable causal connections between the response to SLC products and changes in practice.
- To evaluate the effect of different models of provision and management on the impact of CPD and other products.
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A series of research tools were developed for each stage of the Educational Impact Study, with each member of the team contributing to their development before their sign-off by the client. Research tools were developed to include checklists/aides-memoir for each stage of the fieldwork and for use in Centre visits, discussions with participants and schools and lesson observations.

Task 2: Sample Development

Although the core activity of the Regional SLCs remains training through short courses, a range of product and delivery models are employed and a wide range of topics covered, ranging from changes in curriculum structures to the more creative and frontier science.

The sample of courses to be observed was designed to cover the range of product types, topics and users (e.g. teachers, technicians, individuals with management responsibilities, etc.), as well as coverage across the nine Regional and the National Centres. Consideration was also given to exploring novel products, where more conventional approaches are being examined elsewhere.

Information collected in the Scoping and Initial Evaluation Study on the products available from each SLC was shared to inform the sample of products to be examined in the main stage of the study.

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The fieldwork stage comprised a series of observational case studies, which were longitudinal and allowed both product and participating staff to be tracked from Centres to schools, and into the classroom in order to best assess impact.

Each Centre was visited to observe delivery of training and scrutinise supporting materials – with a strong focus on the likely impact of SLC products – following which 30 visits to a sample of schools and colleges were undertaken.

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- Interviews with Centre Directors, programme coordinators, trainers and a brief discussion with participating educators; and
- Observation of 22 taught sessions across the Regional and National Centres.

Subsequent visit(s) focused on specific activities to cover the selected sample of SLC products, undertaken on a combination of single day and two half day visits according to timetabling and interviewee availability.

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School visits included:

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- Scrutiny of materials such as course notes, follow up materials, in school tasks and any resulting product such as new scheme of work, school produced resource etc; and
- Observation of session or activity – selected by the participating educator as most likely to show the impact of SLC provision. This will clearly require advance contact with the school and individual.

Subsequent visits (typically two half-day visits or one full-day visit) will be arranged wherever possible to enable observations to be well matched to lessons or other activities most likely to yield evidence of impact.

Task 4: Reporting

The report of the Educational Impact Study was submitted in August 2007.

4 Component D – Early Impact Study

This final Component was undertaken between September and December 2007, and comprised three tasks:

- The Early Impact Survey – a postal survey of 5,000 educators to explore their experiences of and satisfaction with SLC services, and the impacts resulting from them. This task also included follow-up telephone interviews with 63 respondents, to explore their experiences in more detail.
- Second visits to the Regional and National Centres – including interviews with Centre staff, and a range of local/regional partners and stakeholders.
- Follow-up interviews with the national stakeholders – to explore any changes in perception and engagement since the initial interviews.

The methodology followed for each task is summarised below.

D1 The Early Impact Survey

This task comprised a postal survey of 5,000 educators who have used SLC services, to explore their experiences of and satisfaction with SLC services and identify the impacts resulting from them. This task also included follow-up telephone interviews with 63 survey respondents, to explore their experiences in more detail.

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The study team identified the topics to be covered in the survey, and agreed this with the Wellcome Trust and the DCSF. A draft version of the questionnaire was developed and circulated for comment prior to piloting.

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Task 2: Questionnaire

The final questionnaire covered the following topics:

- Experiences of and satisfaction with SLC services – for example, content, level, delivery;
- Practical application to learning experiences in the classroom;
- Impact on confidence to deliver high quality science teaching;
- Impact on ability to deliver high quality science teaching;
- Strengths and weaknesses of experience; suggestions for improvements;
- Perceived value of the learning experience;
- Interest in attending further SLC learning; and
- Willingness to recommend the experience to others.

Most of the questions were pre-coded, although there were a small number of open-ended questions. The questionnaire also contained a number of filtered questions which were only asked to either teachers or technicians.

Task 3: Sample Development

The sample comprised 5,000 SLC users who had attended one of the ten SLCs between September 2006 and May 2007, and was supplied using a combination of information taken from the SLC portal and data files held locally by the SLCs themselves. Wherever possible, the sample design included 500 SLC users for each of the Centres, selected randomly within each Centre to ensure a spread of interviews was achieved with different types of SLC users. Several of the SLCs were unable to provide 500 records – to compensate for this those SLCs where there were sufficient records were slightly over-sampled to ensure an overall sample of 5,000.

Task 4: Fieldwork

The main quantitative survey was conducted by means of a self-completion postal survey sent to recent attendees. The fieldwork ran between 17th September and 2nd November.

A reminder letter was sent two weeks after the original, to all those who had not yet returned a completed survey (approximately 4,500 letters) with a new date for completion. A third reminder, this time with a second copy of the questionnaire, was sent at the end of October 2007 to just over 4,300 non-responders. Email reminders were also sent where possible.

During the survey period Royal Mail launched a two week postal strike, delaying both the sending and receiving of questionnaires to and from the SLC users. We believe this had an overall effect on the numbers of responses and contributed to a delay in the fieldwork period. Also for most schools in England and Wales, the Autumn half-term holiday fell during the fieldwork period. This also contributed to a further delay in responses, as questionnaires sent to school addresses were not completed until SLC users returned to school.

Despite the difficulties encountered during fieldwork, a total of 893 postal questionnaires were completed. This is a response rate of 18%; while a relatively low response, each SLC is represented in the survey data, as are teachers from both Primary and Secondary education. Very few SLC users worked in Further Education and consequently we were unable to comment on SLC impact in this sector.

Task 5: Analysis

A series of cross-tabulations were produced, which show the distribution of responses to each question.

Task 6: Reporting

The report of the survey, including the findings from the in-depth telephone interviews below, was submitted in December 2007.

In-Depth Follow-Up Telephone Interviews

In addition to the main survey, qualitative in-depth interviews were conducted with 63 SLC users from the main survey who agreed to be re-contacted. The interviews were conducted by a small team of TNS telephone qualitative interviewers, and were of approximately 15 minutes duration. The interviews took place between 12th and 27th November 2007.

Task 1: Sample

The postal survey asked SLC users to indicate whether they agreed to being re-contacted for further research on this topic. In total, 217 SLC users indicated their willingness to be re-contacted (a response rate of 24%). Hard quotas were not set on this sample because of the small numbers willing to be re-contacted although soft quotas ensured a spread of teacher types and different SLCs were represented.

Task 2: Topic Guide Design

A topic guide was designed in collaboration with the Wellcome Trust and DCSF. The aim was to explore in more detail aspects of the postal survey such as elements of satisfaction with the course and levels of impact the training has had on SLC users.

The guide consisted of approximately 30 questions, around half of which were open responses. Where possible, data from the postal survey was used to pre-populate the responses to the telephone survey to try and minimise the interview length. The interviewers were specialist qualitative interviewers who are specifically trained to probe SLC users for a more detailed response at particular questions.

Task 3: Analysis

SLC users' verbatim comments have been used where appropriate throughout the main survey report to support and illustrate findings from the main quantitative survey.

D2 Second Visits to the Regional and National Centres

This task comprised return visits to each of the nine Regional Centres and the National Centre, and took place between September and December 2007. The visits again featured consultations with SLC Directors and key staff, and interviews with a wider sample of partners and stakeholders.

The visits focused on:

- Reviewing progress and developments over the last year of operation;
- Identifying the impact of SLC provision – actual and expected;
- The extent to which the SLC delivery models had, or were likely to contribute to, impact; and
- The effectiveness of the operational models, and progress made in identifying the challenges identified in the Interim report.

Interviews with local partners and stakeholders included a range of local and regional agencies, and explored the degree of collaborative activity taking place, individuals' views on the Centres and the initiative more broadly, and on their impact to date.

D3 Follow-Up Contacts with National Stakeholders

In all but two cases, the same group of stakeholders were re-contacted towards the end of the study to discuss their views of and involvement with the initiative and the SLC Network. The interviews took place in September and October 2007, with the individuals contacted appearing as Annex II below.

The follow-up interviews allowed change in individual perceptions to be identified, as the initiative has progressed.

ANNEX II – NATIONAL STAKEHOLDERS INTERVIEWED

The national stakeholders interviewed were as follows:

1. Association for Science Education
2. AstraZeneca Science Teaching Trust
3. CLEAPPS (Consortium of Local Education Authorities for the Provision of Science Services)
4. Engineering and Technology Board
5. Futurelab
6. Institute of Physics
7. National Advisors & Inspectors Group for Science (NAIGS)
8. Nuffield Curriculum Centre
9. Ofsted
10. RCUK (Research Councils of the United Kingdom)
11. Secondary National Strategy
12. SETNET
13. Specialist Schools and Academies Trust
14. Qualifications and Curriculum Authority
15. Royal Academy of Engineering
16. The British Association for the Advancement of Science
17. The Royal Society
18. The Royal Society of Chemistry
19. The Science Council
20. Training and Development Agency for Schools
21. Department of Education in Northern Ireland
22. National Assembly of Wales
23. Scottish Executive
24. 1 pharmaceutical company
25. 1 physical sciences company

26. 1 ICT company