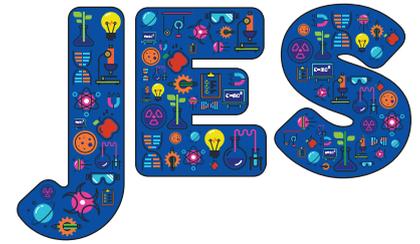


The SSERC Primary Cluster Programme in Science and Technology – Reflections from a classroom practitioner



● Nicola Connor ● Euan Mitchell ● Emma Bissett

Abstract

The Primary Cluster Programme in Science and Technology (PCP), a programme of professional learning for primary school practitioners, continues to have a significant impact on the quality of learning and teaching in schools involved. A major feature of PCP is the creation of a group of mentors who share their expertise amongst their colleagues in primary schools in their clusters. Here, we explore the journey of one mentor through the programme and reflect on changes in her own classroom as well as those of her colleagues.

Keywords: Professional learning, primary science and technology, teacher mentor, programme impact

Background

Since April 2012, the Scottish Schools Education Research Centre (SSERC) has, with the support of a number of agencies (including the Scottish Government, STEM Learning, the Primary Science Teaching Trust (PSTT) and the Edina Trust) been responsible for the delivery of the Primary Cluster Programme in Science and Technology (PCP). Through PCP, SSERC seeks to work with teachers from across a set of primary schools to provide a group of teacher mentors.

Briefly, the first part of PCP provides opportunities for Career-Long Professional Learning (CLPL) at two levels:

- mentors initially participate in immersive, experiential, residential CLPL of 3 days' duration to help raise their levels of confidence and expertise in science and technology. In addition to workshop sessions, mentors are provided with resources (physical and electronic). Ongoing advice and guidance from SSERC personnel is offered; and

- the mentors are tasked with developing a programme of experiential professional learning for all primary teachers in the cluster. The professional learning programme is delivered either by the mentors or by external providers whose contributions have been approved by the team at SSERC.

Some nine months later, mentors participate in a second, immersive residential event, which falls during the implementation of the tailored cluster professional learning programme. At this second residential, mentor cluster groups highlight, *inter alia*, the progress and impact of their work with teachers and pupils. During the following academic year, clusters are eligible to receive support through the PSTT Sustain and Extend Programme (SEP), available through a financial contribution from the Trust. Further detail on the structure of PCP is available in the first article in this issue (see Crawford *et al*, 2020). Since its inception, PCP has been subject to external evaluation and a wealth of data is available on its impact on mentors, teachers and pupils (Lowden *et al*, 2019). In this article, we focus on the impact on teacher mentors and describe how PCP has been a powerful vehicle for change in learning and teaching in one cluster in West Lothian.

In the context of impact on mentors and their own personal development, we will reproduce some of the data relating to the impact of CLPL from SSERC on the roles of mentors (data taken from Lowden *et al*, 2019). Following both CLPL events, participants were asked about the extent to which they expected to take, or had taken, on a greater role in science and technology developments in their school, cluster, Local Authority (LA), and/or nationally. Table 1 demonstrates that, after a relatively short period of time, the overwhelming majority of mentors had taken on development roles in both their own school and in their cluster. There was also evidence that some mentors had embarked on science development roles within their LA and, in a small number of cases, had taken on a role at a national level.



Table 1. Impact of SSERC PCP: how well did the CLPL facilitate the mentors' role?

I will / I have taken on a more significant role in science and technology developments	& Very or quite likely from 1st residential event	& Has happened by 2nd residential event
In my school (N=428 / 370)	98	93
In my cluster (N=431 / 373)	98	90
At local authority level (N=430 / 363)	47	21
At national level (N=427 / 364)	15	9

(Numbers in dark blue = after residential 2). (Data from Lowden *et al*, 2019.)

The observations of mentors are supported by those of senior managers, who indicate substantial impact from the Programme on school and cluster developments in science and technology roles.

For example, almost all senior management responses (90%) indicated that *their staff had taken on a more significant role in science and technology developments*, and a large majority (79%) also reported that *their school had taken on a greater role in science and technology developments within their cluster*. There was less evidence of impact at the LA or national level as a result of the Programme; this is hardly surprising, since the Programme is designed primarily to foster developments at a school and cluster level (see Table 2).

We believe that the experiences of one of the authors (NC) are mirrored by those of significant numbers of mentors across Scotland. There is

ample evidence that the PCP is ensuring improved learning and teaching for pupils across the primary sector at a time when government policy and strategy call out for such changes (Donaldson, 2010; Scottish Government, 2017). In the next section, we will explore the impact that participation in the PCP has had on one of the authors (NC).

What is it like to be a mentor?

Nicola Connor is a SSERC mentor and class teacher at Peel Primary School in the Inveralmond Community High School Cluster in West Lothian (for further information about Nicola, see SSERC, 2019). Prior to her involvement in PCP, Nicola had little by way of a scientific background, but a keen interest in the subject area. In 2016/17, Nicola was one of 6 teachers to represent the Inveralmond Cluster at PCP.

Table 2. Changing role of the school in science and technology developments.

Action	% has happened
Staff have taken on a more significant role in science and technology developments in the school (N=215)	90
The school has taken on a greater role in science and technology developments within our cluster (N=210)	79
The school has taken on a greater role in science and technology developments at local authority level (N=196)	25
The school has taken on a greater role in science and technology developments at national level (N=194)	7

(Data from Lowden *et al*, 2019.)



Soon after the residential at SSERC, Nicola and her fellow mentors met to discuss what the CLPL programme would look like for the Inveralmond Cluster. It was agreed that, to know what the teachers wanted and needed, they would have to assess teacher confidence on their delivery of science within the classroom. Teachers were invited to complete a questionnaire to identify those areas of the curriculum that they found challenging in terms of delivery. Based on the data provided, Nicola and the mentors were able to design a bespoke CLPL programme that met the teachers' needs, utilising the expertise of both mentors and external providers.

All mentor-led sessions were fully attended and very well received. One of the factors that was crucial to the success of the mentor-led programme of professional learning was the excellent support from the cluster schools' senior leadership teams in assuring that attendance was compulsory. Following the implementation of the CLPL programme, Nicola and her fellow mentors carried out a follow-up survey and the data gathered indicated that staff found an increase in their levels of confidence in their delivery of science. This in turn has also enabled the associated cluster primaries to further enhance the links with the associated secondary school.

Knowing that teachers require appropriate equipment to run engaging science lessons, Nicola and her fellow mentors decided to create several shared cluster resource boxes. These boxes would be stored centrally and accessed by the cluster primary schools. Some of the resource boxes were purchased with additional support via a grant from the Edina Trust. This additional funding stream allowed access to enhanced teaching aids, guidance and worksheets provided and written by the mentors. During the two years since they became available, the resource boxes have been incredibly well used and remain popular. This model has been highlighted as an example of excellent practice.

Inveralmond Community High School had previously worked closely together on moderation of literacy and numeracy; however, through PCP, the Cluster has worked much more closely together on science and the mentor group is still very active

two years on, despite the challenges of staff turnover. Nicola continues to attend other SSERC professional learning events and, in 2018, won a UK-wide ENTHUSE STEM award for her Excellence in STEM Teaching¹.

Nicola is now the lead science co-ordinator for West Lothian Council as they progress through the PSTT SEP. She feels that this leadership role has provided her with an excellent opportunity to unite the PCP clusters and has given the mentors a larger platform from which to share expertise, experiences and contacts across the LA. In her role, she has been able to recruit new mentors who are incredibly keen to share the robust SSERC CLPL that they have undertaken to continue the delivery of science CLPL across the LA. The LA, following the success of PCP, has now set up a STEM Strategy Group to create a STEM agenda/rationale/aims for the authority, in which Nicola and a number of mentors are included.

The impact that the programme has had on the pupils across the cluster has been amazing. Pupils' perceptions and misconceptions of scientists and science in general have been addressed. There is now a consistent whole-school approach to science; the school proudly shares its work through social media and the school blogs. Nicola states that the pupils in her school love science and that they are more motivated to learn. Everyone, regardless of age or stage, gets a new experience in science and now the school seeks to use expertise from outside the school, bringing in partner providers and parents with a science background to talk to the pupils more frequently.

Through her journey in PCP and PSTT SEP, Nicola herself has grown in confidence and, in addition to winning the 2018 ENTHUSE Award for Excellence in STEM Teaching, she has been involved in several exciting science opportunities. She has talked live via video conferencing to teachers in Victoria, Australia; she was included in an article for an EU report about science teaching in different countries; and, most recently, she talked about her experiences in PCP as part of a joint reflective seminar, *Scotland's National Primary Cluster Programme in Science and Technology: Impact on Learning and Teaching*, with SSERC at the 2019 PSEC conference.



Acknowledgements

The PCP is supported by the Scottish Government, PSTT, STEM Learning and the Edina Trust. We wish also to acknowledge PSTT for its additional funding stream, which has provided support for Emma Bissett's post at SSERC.

References

- Crawford, K., Lowden, K., Hall, S., Mitchell, E., McErlean, T., Sherrard, H. & Daley, L. (2020) 'The SSERC Primary Cluster Programme in Science and Technology – Impact on Teaching and Learning', *Journal of Emergent Science*, (18)
- Donaldson, G. (2010) *Teaching Scotland's Future – Report of a review of teacher education in Scotland*. Scottish Government. Available from: <http://www.scotland.gov.uk/Resource/Doc/337626/0110852.pdf> Accessed 26.08.19
- Lowden, K., Hall, S., Lusk, D. & van Amersfoort, D. (2019) *Evaluation of the SSERC Primary Cluster Programme in Science and Technology Final Report: Teacher Survey, 2012-2018; Pupil Survey, 2015-2018*. Available from: <https://www.sserc.org.uk/professional-learning/evaluations/> Accessed 26.08.19

Scottish Government (2017) *Science, Technology, Engineering and Mathematics - Education and Training Strategy for Scotland*. Available from: www.gov.scot/Resource/0052/00526536.pdf Accessed 26.08.19

SSERC (2019) 'The Scottish Primary Cluster Programme – A Teacher's Journey, 18-19', *Why & How: The Primary Science Teaching Trust Magazine*, (6). Available from: https://pstt.org.uk/application/files/4615/7122/6447/Summer_2019_Trust_Newsletter_online_-_with_disclaimer.pdf Accessed 10.11.19

Nicola Connor, Peel Primary School, Elburn, Livingston.

Euan Mitchell, Scottish Schools Education Research Centre, Dunfermline.

Emma Bissett, Doodlebugs Day Nursery, Aberuthven.

E-mail: evan.mitchell@sserc.scot

¹<https://www.stem.org.uk/news-and-views/opinions/meet-winners-2018-enthuse-celebration-awards-nicola-connor> (accessed 10th November 2019)

