NCSL National College for School Leadership

www.ncsl.org.uk

Account of practice

What are we
learning about...?

'Making mathematics count' in school networks

Closing the gap in mathematic attainment

Small Schools Managing Improvement Group NLC

An illustrative example of what effective network practice for improving teaching, learning and leadership in mathematics looks like in action.

Networked Learning Communities

learning from each other | learning with each other | learning on behalf of each other

Closing the gap in mathematic attainment

The accounts of practice presented within this series are generated from the work of practitioners involved in school networks. They aim to reflect the best of what is known from networked learning in action in order to provide concrete examples of networked learning practice. In particular, they provide a practical illustration of the significant elements we have found to be evident in school learning networks when developing network practice for effective teaching and learning in mathematics.

> ***"Across the country, teachers of mathematics have been teaching, enquiring and learning together. By creating subject-specific learning networks, they are finding ways to solve some of the problems currently facing the profession. More importantly, they are improving the learning experiences of children in classrooms and schools, and in a diverse range of contexts nationwide"***

There are now many schools, both in the UK and internationally, that are benefiting from working together as a network. By drawing upon their experience, and from the range of research that has been undertaken in school networks, it is possible to identify how networks of teachers are helping to address three key issues associated with effective teaching and learning in mathematics.

Three characteristics of network practice for effective teaching and learning in mathematics

1. ***Doing mathematics together in networks to enhance specialist subject knowledge and increase the supply of confident teachers of mathematics.***
2. ***Planning and working together in networks to ensure that the current and developing mathematics curriculum, assessment and qualifications framework meets the needs of all learners.***
3. ***Problem-solving and learning together in networks to provide the infrastructure required to support mathematics teachers effectively, particularly in terms of their continuing professional development.***

The four accounts in this series explore in different ways and with differing emphases the characteristics of effective network practice for improving and developing effective teaching and learning in mathematics. Consideration of these factors when developing learning networks of mathematics teachers and other mathematics practitioners will help ensure that future development is built from the best current thinking and practice. We hope that these accounts of practice will, therefore, be of practical use to you – if you are considering setting up a network, are part of a newly formed or established network, or if you are simply interested in finding out more about making mathematics count in school networks for the benefit of both teachers and children. □

Acknowledgements

We would like to thank all those who contributed to the generation and publication of these accounts of practice: Debbie Adams, Jo Clarke, Jacqui Darrington, Rita Davidson, Karen Gardener, Jenni Gayter, Sian Harrison, Martin Hole, Sylvia Jones, Kim McEwan, Carol Morgan, Melissa Murphy, Philippa Pickering, John Westwell and the mathematics teachers and Local Authority colleagues in Blackburn with Darwen.

Nick Martin & Non Worrall
Lead Developers

Closing the gap in mathematic attainment

Small Schools Managing Improvement Group (SSMIG) is a collection of eight primary schools in Telford, Shropshire. They began to meet informally to discuss common issues and provide collaborative support for each other. They felt their Local Authority focused support on schools 'in inverse proportion to success' and because this meant they had little direct support, they turned to each other for professional support and guidance.

The story of the SSMIG's numeracy project outlines how networked learning can enhance and improve attainment even in schools deemed successful. It shows how a network can act as an effective form of professional development and support in the place of direct Local Authority involvement. It also shows how networked initiatives can define teaching methods in schools. This network is a good example of a de-centralised network design which uses its capacity as a vehicle for collective problem-solving and learning together. The numeracy project has provided a unique form of Continuing Professional Development (CPD) for Teaching Assistants (TAs) who do not have as many CPD options available to them.

Will I remember this on Monday?

In 2002, the group discussed as a network the issues facing them. One of the major issues for all was to close the gap in pupil attainment. The schools had identified pupils that were achieving above Special Educational Needs (SEN) level but below Springboard level, with a learning gap particularly noticeable in mathematics. They felt that these pupils were missing out on support that could improve their attainment and they decided to create their own networked support system.

A 10-week project was devised called 'Will I remember this on Monday?' This title summed up the problems the pupils were having, namely not being able to remember what was taught from one day to the next. The goal of this project was to explore ways in which pupils experiencing poor short-term memory and slow progress could be helped through a multi-sensory approach. All 8 schools were involved, and 16 pupils were targeted who were tested at the beginning and at the end of the project.

It's as easy as….1, 2, 3

The project allowed all eight TAs to meet together to share ideas and to receive joint CPD. Each school involved decided how it wanted to implement the project, and planned the sessions. The network initiated the project in the following steps:

1 Doing mathematics together

The project allowed the group of TAs to receive numeracy training together from an external consultant. It also allowed TAs to experiment with different ways of teaching mathematics. The emphasis in their training was on simple, easy and non-expensive practices.

2 Planning and working together

The project involved SEN co-ordinators and TAs working together, focusing on Years 3, 4, 5 and 6. The network met once every half term for half a day. Headteachers, teachers and TAs planned and worked together on the numeracy project. In these meetings, objectives, timescales and assessment options were all planned. The group also decided how the project would be implemented in each school, who would implement it, how the projects in each school would pursue the same goals and how they would collate and feed the research back to the network. Within each school, teachers and TAs worked differently together to plan the withdrawn pupils' learning.

3 Problem-solving and learning together

The group worked together during meetings to solve problems that arose during the project. One of these problems was how to assess pupils. Aware of the limited options for assessing numeracy, the network experimented with different methods before deciding that the NFER 5–14 test suited their requirements. Within the meetings, TAs and teachers felt they gained value from learning together and from the other schools in their network. Most importantly, they learnt which practices were working and which weren't. □

Network account

St Peter and St Paul Catholic Primary School is one of the schools in the SSMIG NLC and is situated in the small market town of Newport. Pupils attend from the immediate town but some travel from up to ten miles away and the majority are from Catholic backgrounds. The school has been deemed 'very effective' in inspections, and at the end of Year 6, standards have been above or well above the national average in English, mathematics and science.

The numeracy project

Three children were targeted for the numeracy project from mixed year groups and two classes. Two TAs worked three times a week for 30 minutes outside classes for the ten-week period. The TAs were involved in implementing the project along with their two class teachers. It was decided from the outset that the children concerned would work within a group. This was due to the presence of others in the class who needed support and who would otherwise have been left out. Also, many of the activities were paired, and it was felt that these three children would feel more comfortable being withdrawn as part of a group.

Both the two TAs and the class teachers decided together how the project would work within their school. It was felt important that the new project did not create more problems, fitted in with the curriculum and did not interfere with the existing strategies such as Springboard.

A major decision for this school was where the sessions would take place. They felt strongly that they wanted to withdraw the children from the classrooms and, although difficult at times, this has been achieved.

The two TAs planned and led two small groups. Within these groups were the three targeted children for the project from Years 3, 4 and 6. The planning of the sessions can be seen as a form of professional development for the TAs who normally would not be involved in planning. The two TAs worked together to devise a similar format they both would follow. After initially working with this plan, they made improvements together, particularly in creating a simple way to evaluate and link observations back to the class teacher.

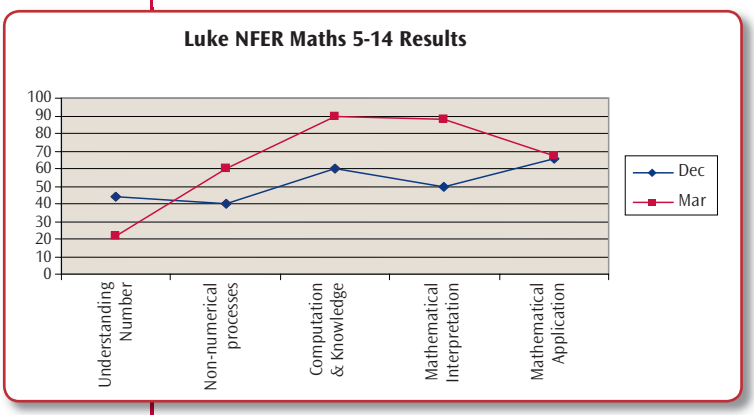
Trust was a key theme that emerged in the school's reflections. The TAs felt valued as they felt trusted by their class teachers to carry out the planning. The class teachers also felt that they could rely upon the TAs and could trust them to consult with them on any problems or issues arising.

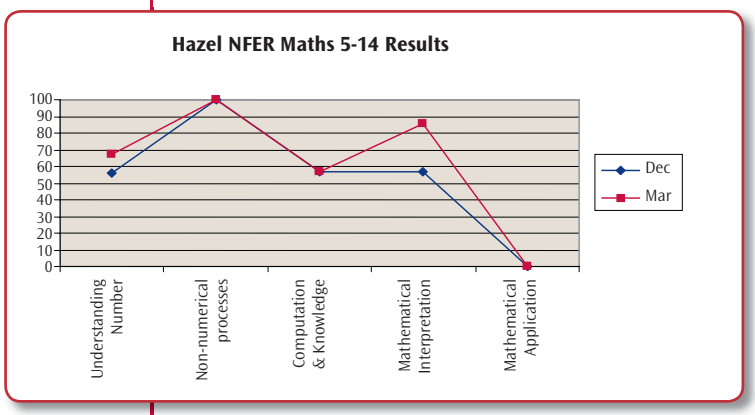
The TAs involved were given external training and support from other members of staff. This again added valuable professional development by allowing them to receive practical training and experiment with these new methods during their sessions.

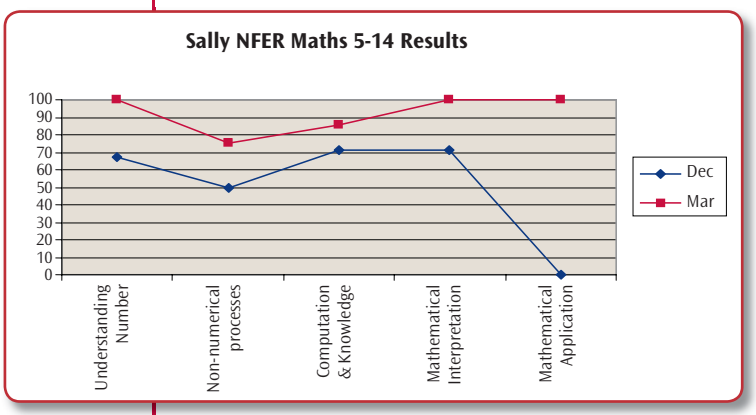
In this school, the numeracy project provided a double-edged improvement strategy. Classes began with all pupils involved in introductory exercises. Then the target group withdrew from the class and engaged in the sessions with the TAs. The rest of the class split into two groups based on ability and focused on more challenging exercises. This allowed teachers to stretch their development without the risk of affecting the lower-attaining pupils' understanding. At the end of the class, the target group rejoined to recap on the chosen topic.

At the end of the project there was a clear and measurable improvement in all three pupils. In addition to this, there were many perceived benefits within the school. The TAs had enjoyed the personal satisfaction of implementing a project which had provided evidence that it was working. The pupils had enjoyed the sessions and felt more confident in dealing with mathematics. The teachers experienced the benefit of knowing that they were effectively dealing with the full range of ability in their class. The headteacher benefited from knowledge that the project, shared and initiated with similar schools, was improving pupil attainment in all abilities, adding a new form of CPD for TAs and enriching the working relationships between TA and teacher.

The impact of the numeracy project







These results clearly show an improvement in all three pupils during the 10-week period. In addition to this, the TAs perceived many other changes within the pupils. The main improvement was in the pupils' confidence. All of them felt more confident and more enthusiastic about learning mathematics.

❝ I like SSMIG maths because it is fun and it helps me to learn more. ❞

Pupil in numeracy project

The TAs felt that the children involved in the group were able to say that they didn't understand, whereas in the classroom they would have stayed silent. The TAs felt their group gave the pupils the space to make mistakes in an environment where they did not feel self-conscious.

❝ It's very frustrating when you see children not absorbing the information and their confidence getting smaller and smaller. It's nice to be part of something that can help, and see the pupils' progress. ❞

Network Teaching Assistant

The TAs and teachers involved felt that the sessions gave pupils a chance to establish their learning and to remember it before moving on to another topic. One of the school's areas of concern was that pupils had knowledge gaps that were being skipped over and never being filled in. In the group, the TAs were able to spot those gaps and deal with them so that pupils had a greater chance of joining in with the rest of the class.

❝ I felt that when I went back into class I could do bits of maths that the others were doing. ❞

Pupil in numeracy project □

From networked initiative to school change

In April 2003, all the school TAs presented their work and findings in a network meeting. Attending the presentation were all the staff from the 8 networked schools, some 80 people in total. Each school's TAs presented how they had carried out their project, what teaching practices they had used, measurable outcomes for targeted pupils, perceived outcomes, and their experiences. The presentation was deemed both interesting and valuable to all the schools involved.

This led to what was originally a ten-week project being incorporated into standard teaching practice in each school. Across the network, the TAs, teachers and pupils had immensely enjoyed being part of the project and felt that there was still much to gain from this way of working.

" We want lessons to continue as they help a lot and we can understand more in class. "

Pupil involved in numeracy project

The schools involved decided to continue the new way of working within the boundaries of each school's own organisation and resources. Each school had the freedom to incorporate the project and plan in the way that suited its needs. This way of working continued with the added knowledge of what the other schools in the network had found useful.

Specific new teaching practices were learnt and there was evidence that these new methods and resources were being used in the classrooms. The different methods of teaching gave the pupils access to material that they had previously found difficult and increased the TA's knowledge of how their pupils learned. This in turn made the TAs involved more comfortable in their role of learning support and increased their sense of personal value and job satisfaction. So while the aim of the project was to close the gap in pupil attainment, it also had the added bonus of being a unique and valuable form of CPD for Teaching Assistants.

" We feel that the project was both productive and worthwhile. It was a refreshing change to have a focus on numeracy. As an added bonus, we feel that fun was had by all – not just by the children: we had fun too! "

Network Teaching Assistants □

End note

The example of the SSMIG numeracy project highlights many interesting aspects of networked learning.

- Firstly, the time and space to problem-solve shared concerns, in this case the lack of support for pupils in between SEN and Springboard level.
- The networked resources enabled a project to be designed and implemented to tackle this issue as a network, without having to rely on or wait for Local Authority support.
- The project allowed TAs to receive training together in new teaching practices and to work together. Although the project had a clear pupil learning focus, it opened up a whole new area of CPD for Teaching Assistants. It also changed the relationship and way of working between TA and teacher.
- The project produced clear and measurable outcomes in pupil attainment, while re-introducing fun and enthusiasm in both teaching and learning.
- Finally and most importantly, what was simply a ten-week trial project developed out of networked problem-solving became a permanent teaching practice within the schools. This highlights how networked learning can produce an innovative range of improvements. How many other strategies, at this cost, could positively affect attainment, teaching, learning, CPD, staff relationships and school practice at once?

This account of practice reveals some of the possibilities for mathematical learning achievable through school networks. However, it is just a glimpse of how schools working together can become powerful and innovative forces for school transformation. □

Contact details

Contact: Carol Morgan
Small Schools Managing Improvement Group NLC

Address: St Peter & St Paul Catholic Primary School
Salter's Lane
Newport
Shropshire
TF10 7LB

Tel: 01952 811171
Fax: 01952 272063

Email: H3352@telford.gov.uk

What are we **learning about...?**

The 'What are we learning about…?' series is designed to make public the learning that has emerged from NLCs in the last two years.

The first nine titles in the series will focus on:
What are we learning about…?

- LEA involvement in school networks
- Establishing a network of schools
- Community leadership in networks
- ***'Making mathematics count'* in school networks**
- The impact of school networks
- Sustaining a network of schools
- Facilitation within school networks
- Professional development in school networks
- Leadership of school networks

To order a copy of this publication and others in this series, please email **nlc@ncsl.org.uk** quoting the reference **WAWLA/Making mathematics count**

National College for School Leadership
Networked Learning Group
Derwent House
Cranfield University Technology Park
University Way, Cranfield
Bedfordshire
MK43 0AZ

T: 08707 870 370
F: 0115 872 2401
E: nlc@ncsl.org.uk
W: www.ncsl.org.uk/nlc

NCSL National College for School Leadership