Project: Talk for Writing in Primary Maths Classrooms

A case study by Mari Palmer, St. Hedda's RC Primary School, Esk Valley Alliance.

Origin of project

I work in a very tightly knit cluster of small schools in the Esk Valley, which is near Whitby, in the North Yorkshire Moors National Park. We had been using, to a varying degree across schools, Talk for Writing for a considerable period of time and were very happy with the outcomes for children and the enjoyment and engagement that it brought to lessons.

As we were already working as a cluster, and doing quite a considerable amount of literacy work together, we decided we would like to take part in some joint mathematics working and settled on a NCETM funded project into 'The Year Three Dip' and how to prevent this. The Year Three Dip is a somewhat greater issue in small schools as often it is the only time they will move between teachers in the whole time they are in primary school as we only have two classes.

We decided we would focus on the four main calculations and how children could use 'memory hooks' to remember their chosen calculation methods. These methods could then be transferred between classes so the calculation methods could be presented in a style the children were familiar with, and they were able to recognise them. The children would still be taught to recognise problems in many different forms but they would know to return to the method they were familiar with.

The original project

Eight schools began the project and as a group we explored different ways of using 'memory hooks' to support mathematical learning, with help from Dr. Tony Leach (York St. John University) and Dr Helen St Clair-Thompson (University of Hull). We looked at, and researched, a variety of techniques including mind maps but settled on using techniques similar to those used in Talk for Writing. We decided to use three main strands:

We used actions to support recognition of the different vocabulary for addition, subtraction, multiplication and division and the children would then chant these to remind themselves of the different words that can be used for each. We had posters on the walls to remind us of the actions and so children could refer to them while working. It was in a similar style to the actions for connectives in Talk for Writing.

The teachers found this worked really well and it has continued in many of the schools. It is easy to fit into free 5 minutes, such as lining up for dinner, and we have anecdotal evidence to show it has succeeded (such as one child seeing a 'reduce speed now' sign and saying 'that means take away' whilst doing the action for subtraction.)

We used 'story maps' to remind the children how to perform their calculations and so each child would have a different story map for each of the four calculations. We were hoping they would be able to draw their own story map and then practise reciting it so that had a form of 'little rhyme' in their heads so that they would be able to talk themselves through each of the calculations as they did them.

We found these worked really well and the children were confident with them quite quickly, showing evidence of improvement in their calculation skills. There was room for improvement though as the ideas were a little too abstract for the children to draw their own maps so we ended up drawing the story maps for them.

We used a method similar to 'boxing up' to guide the children through word problems. This was partly drawn from a case study on the Talk for Writing website from Brighton. The idea was that children would split the process of solving a word problem into four parts; deciding what sort of problem it was (+, -, x or ÷), deciding what method you would use to solve it, solving it and then, finally, checking it. This proved to be too complicated for KS1 children and although it looked promising and worked well with lots of teacher support, it was not a successful strategy for encouraging independence with word problems.

Evidence was collected of the success of the project by testing children at the start and the end of the intervention period, by discussing with children and staff (teachers and teaching assistants) and by anecdotal evidence from

the staff members involved in the project. All the children made progress within the period when tested (between 7 and 30 +%) and the teachers, pupils and teaching assistants all felt that the methods had shown evidence of improving the children's performance.

What we have learnt since

Due to the success of this project we have continued to use some of these methods in our school and others. Further understanding has developed as follows:

1. Thorough understanding of calculation policy

   An indirect benefit of the story map work has been a much more thorough understanding of the school's calculation policy. Before this process I felt that I was confident in having a thorough knowledge and understanding of our school's calculation policy. However, it was not until I unpicked it in this depth, that I became aware of some reasons why children may be finding it hard to move from one step to another, and I became more confident about pushing children to the next step if they were capable.

2. Danger of 'expressing' children through too fast

   I did, however, find that it was then a bit too easy to push children on a little quickly towards the next abstract stage, before they had a complete understanding of what was involved using concrete methods. In future I feel the children would need to 'mess about' with problems in a concrete manner far more before they reached the abstract stage. There was a temptation with more capable children and older children, to move straight between the abstract ideas and the project made me realise (in agreement with many other current projects I have read about) that even these children need to have some time to explore ideas to ensure a thorough understanding before they move to an abstract question. I felt this would support Talk for Writing principles as it would mean spending a good amount of time on a project, looking at it from different angles and discussing the work, before it was written down.

Further developments

This year (2014/2015) we are planning to further our project using the methods that we have been developing. We are planning to conduct some wider-scale research, using a greater number of teachers and over a longer period of time.

We are able to put a small amount of funding towards this as a Teaching School Alliance and linked to a Maths Hub at Red Kite that will enable us to work with a larger geographical area and include more teachers. We also hope to present our work at conference at the end of the year and then seek advice on how to develop further if the project is a success.

We hope that this more in-depth project will be similar to the first but we will focus on the following:

1. Children drawing their own story maps

   The process of drawing the story maps will be reversed. Instead of giving the children a story map for them to learn and recite which they then use to perform the calculations we will be doing a considerable amount of practical learning (tying in with other projects that are working in this area) and asking the children to draw their own story maps.

2. Calculation policies being closely linked with the story maps and divided into clear stages that the pupils can guide themselves through.

   Our calculation policies and story maps will be divided into clear stages so we are rigorous in knowing where each child is and how they can improve. Between each stage there will be a period of 'learning through maths play' that will enable them to be ready for the next stage of the calculation policy.

3. Continued use of actions for vocabulary throughout the school

This project was written up for NCETM and can be seen on their website (https://www.ncetm.org.uk/files/17331582/CTP1213+St+Heddas+Final+Report.pdf).