

**Action Research Title:** Identifying, supporting and extending children who show a potential for or are already gifted and talented in mathematics, including the application of problem solving strategies and higher order questioning. By Helen Ashe – ConnectED SLE

**Contact:** [h.ashe@barrowcevcprimaryschool.co.uk](mailto:h.ashe@barrowcevcprimaryschool.co.uk) for more details.

## **NCETM Research Final Report**

### **A statement of the theme that we were following**

Identifying, supporting and extending children who show a potential for or are already gifted and talented in mathematics, including the application of problem solving strategies and higher order questioning.

### **The aspects of the theme we were aiming to pursue within the network**

We chose this strand as both schools were aiming to develop class teacher's abilities to identify Gifted and Talented children and to research some key strategies to support them and help them develop to their full potential in this subject. The short term aim was to develop shared techniques for both schools whilst developing subject and pedagogical knowledge through collaborative CPD and joint research. The long term aim is therefore to increase the number of children reaching above age appropriate levels in both schools.

We selected this element to focus on in our study, as we believe that identifying and extending gifted and talented children is a key area of development for both subject leaders and class teachers. By focusing on children in the Early Years and Key Stage 1, we aimed to 'catch' the children at the earliest stages of their mathematical development. By focusing on criteria to highlight children who are gifted in mathematics we aimed to support staff in making correct judgements, as well as looking for those children who, with the right learning opportunities, could become gifted.

Initial joint problem solving workshops enabled teachers to re-evaluate their previous gifted and talented assessments and review the children they had selected. Subject leaders and class teachers then worked closely together and with identified children from both schools in a collaborative lesson study led by a consultant maths specialist. This focused on problem solving strategies to enable teacher's to clarify and explore their initial gifted and talented assessments. On the recommendation of our chosen consultant, we decided it would be beneficial to focus on higher order questioning and the impact of teachers' intervention during problem solving sessions.

In the resultant follow-up sessions teachers explored collaboratively how the careful use of questioning can encourage children to think rather than just remember.

### **What the members of the network learned about the theme**

The key evaluations from the workshops undertaken were as follows:

- Staff have begun to use a wider range of assessment methods, particularly practical problem solving activities.
- Additional methods of identification allow staff to assess a wider range of skills and therefore include those children who do not display their potential as obviously as their peers i.e. ‘the quiet thinkers.’
- Using a variety of methods has further widened the scope of identification to also include those children who are capable of thinking ‘outside the box’ and not only those who are working above age-related expectation.
- Importance of simply observing children working through a problem to determine the level of their thinking.
- Staff have recognised the need to allow more time for the children to show their thinking and thought processes
- The sessions highlighted the need for staff to provide more opportunities that both scaffold learning and enable the children to lead and take control of the paths they may choose.
- Staff now provide more time for children to ask questions and enquire.
- The project has highlighted the need to phrase questions differently and/or more carefully, for example, ‘what can we say about this’, ‘do you think it’s going to be O.K?’.
- Allowing more time for children to think before jumping in with prompts, promotes increased independence in learning.
- Staff have reassessed the notion of problem solving. They feel they have become more aware of the need for children to be engaged in a wide range of practical problem solving activities. This includes activities with no definitive solution but those which can be approached by the children in a number of ways.
- Importance of simply observing children working without interrupting or influencing their thinking processes.
- Teachers have become more skilled in planning opportunities for focused questioning.
- Staff are able to respond more confidently to the children’s ideas rather than sticking rigidly to their own plans or objectives.
- Teachers feel more confident are therefore are able to provide a more relaxed environment so that children can explore different areas of maths through their learning!

### **The impact of this teacher development on learners**

- Changes to gifted and talented assessment methods allows for all children to access identification activities. This enables the majority of children to demonstrate the full range of their skills and understanding.
- Staff provide more open ended tasks to challenge the more able children.

- Children are given the freedom to find their own way through problems, providing them with ownership of their own learning.
- Children are allowed to make their own mistakes and follow their own thought processes.
- Children are encouraged to take risks and are more willing to tackle problems independently.
- Children have voiced increased motivation and enjoyment when participating in more open-ended activities that *they feel* challenge them appropriately.
- Children are provided with more time for thinking.
- Less teacher assumption.
- Increased emphasis on telling rather than showing; encouraging the children to articulate their thoughts and not just follow processes.
- Teachers put less emphasis on finding a right answer or method.

### **How working as a network promoted teacher learning**

All staff reported that they felt that working in partnership with another school was a supportive and useful experience. Staff commented that it afforded them the opportunity to work collaboratively and share views with other teachers from the same year group/Key Stage. Indeed, having the opportunity to discuss pedagogical ideas was reported to be a positive experience, particularly for West Row as they are a one form entry school. Teachers had the opportunity to jointly observe children to explore and identify learning and this provided them with the time and space to evaluate methods and ideas; being able to come to a shared understanding of what worked well and why, in order to develop the whole teaching community.

For both subject co-ordinators, the project presented the opportunity to lead a collaborative project, engaging with staff from both schools. The experience has, therefore, increased subject leader confidence in planning and leading cluster initiatives. This project has provided us with the opportunity to lead professional learning through children's learning and this should have a long-term implications on standards and achievement within within both schools. The regular meetings between subject leaders also provided us with opportunities to hold frequent professional dialogue regarding the teaching of maths within our schools.

Through this collaborative process, conceptions of CPD have also been actively addressed with EY and KS1 staff in both schools; the nature of the learning-focused activities undertaken by staff having a direct relationship with their classroom activity. The project

has enabled teachers to reflect on their practice, whilst also focusing on their contribution to the learning and attainment of gifted and more able pupils. This process has resulted in staff engaging in maths-related CPD over an extended period to enable individuals to embed their learning into daily classroom practice.

Raising standards in maths is a key area for development on both School Improvement Plans and this project has served to heighten the profile of teaching and learning in numeracy across the both schools. The type of activity undertaken has enabled participants to relate the focus of their own development within the wider context of the each schools' priorities.

#### **What the members of the network intend to do next**

- Increase the use of problem solving through planned weekly sessions.
- Where possible offer more open-ended and less structured tasks in other areas of numeracy.
- Tracking of children's progress throughout both schools to the end of the primary phase to assess the impact on standards and achievement.
- Involving parents of gifted and more able pupils in their child's mathematical development through workshops and homelearning.
- Feedback findings of the project to all Key Stage 2 staff in both schools.