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NPQSL Case Study
Developing the use of precise vocabulary to improve standards in mathematical reasoning and narrow the gap between reasoning and arithmetic attainment.

NETSP North East Teaching Schools Partnership

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At the time of delivering this project, my school was in the final year of its transition from a first to a primary school, which we saw as an opportunity to reevaluate and refine teaching and learning. The motivated and reflective staff team are consistently enthusiastic about the introduction of new ideas and, as we were working on a redesigned curriculum with a focus on the teaching of core, transferable skills alongside an awareness of the wider world, I saw an opportunity to begin strategically developing children's vocabulary as a way to explain, discuss and reason about their new learning.

This project began as a way to develop the use of precise vocabulary in mathematics teaching to improve mathematical reasoning across school, as this is my area of responsibility and specialism. I had identified a considerable discrepancy between arithmetic and reasoning scores across the whole school, despite a confident delivery of a mastery curriculum in each year group. The importance of developing vocabulary in children has increasingly been a focus in educational literature and curriculum development materials, not least because Ofsted placed a high level of importance on it as a core skill for academic success in their curriculum workshop in Autumn 2018. I felt strongly that if precise mathematical language was taught, and insisted upon, children would have a much more efficient vocabulary toolkit with which to explain their reasoning and provide proof for their mathematical statements. In addition to this I saw an opportunity to extend the deliberate modelling of how to use sentence stems to answer questions in mathematics to all curriculum areas, to further assist with children's academic progress in other subjects, as found by Larson, Dixon and Townsend (2013).

I began the project by interviewing children on their confidence with mathematical language, and found that they were much more enthusiastic about tasks where they could either use pictorial methods or abstract calculations. From learning walks and book scrutinies, I also identified that there was some upskilling of staff needed for vocabulary to be taught at the level of precision that I intended. As a qualified PD Lead with the NCETM I had some background understanding of the value of high quality CPD to build staff confidence and to achieve a high level of buy in to my project, so delivering this was immediately a priority. I followed the advice of Matthews (2009) and made an effort to lead by example, inviting colleagues to observe my teaching of maths, promoting professional development by leading sessions of my own design, and providing colleagues with vocabulary and sentence stem resources that could be instantly used within both maths and other subjects. Colleagues reported that the opportunity to peer observe was helpful, especially as they could see the progress their children had to make by the time they reached Year 6.

Pupil progress data from the end of the year showed a clear impact. To me the initial discrepancy between reasoning and arithmetic scores in every year group had suggested that children are more confident with maths assessments when they do not need to assimilate written information with their understanding of mathematical concepts. This was further supported by my analysis of reading results in Year 5, where a clear gap between reading age and comprehension scores could be seen and that vocabulary was in fact the weakest area of reading. By the end of the project, the gap between arithmetic and reasoning scores had narrowed in all year groups but one, and in Year 3 reasoning scores had surpassed those of arithmetic. While this could be attributed to a number of factors, pupil quotes, such as the following from Year 3 and 5 children, also supported the impact the specific vocabulary teaching had had.

"I like it when the teacher puts the sentence starter on the board because I only have to finish it and I can think about my answer."

"It was good learning about different types of answer, it's much better to say why something happened than just describe what you did."

Personally, the programme completely changed my view of school leadership and of myself as a leader. Prior to this I had had a varied (and not confident) experience of leadership in several job roles, and as a middle leader with only a subject responsibility I identified at the beginning of the project that 'Leading with Impact' was my least secure area. For the project to be successful I had to work with colleagues from all Key Stages, not just my own, in a school where leadership was already well distributed, and my initial staff survey showed that I was not perceived as a leader in school by colleagues I didn't directly work with. I spent a lot of time reflecting on my own strengths and weaknesses using Belbin's 'Team Roles in a Nutshell' (2015) and felt strongly that I needed to break the mould of a leader who delivers pedagogical CPD relating solely to maths - almost someone that Gabriel (2015) would describe as a 'technocrat' - and extend my colleagues' perception of me to encompass a more general role as a leader who cared about their personal development in all areas, and how this impacts on the progress of pupils in school. From applying my new knowledge gained through reading, leading by example and ensuring that at all times my initiative was manageable for colleagues in terms of both time and physical resources, my second staff survey showed that colleagues were much more likely to think of me in a leadership role, and were overwhelming positive about the impact the initiative had had on their teaching. One of the most meaningful quotes from a colleague for me was: 'This has made my life so much easier'. Reading back on my own reflections this was something that I had intended to achieve from Day 1, so I was delighted that I had been successful in supporting my team.

Most excitingly, the project has since opened many avenues for exploration, and we are continuing to develop our school curriculum with a significant focus on vocabulary in all subject areas. I am now conducting my own action research project into how children's general vocabulary can be broadened by the discrete teaching of a new word every day, and in my new role as a senior leader have been able to disseminate this to the rest of the staff in my key stage.

References

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