RESEARCH QUESTION

If we increase the number of scientific enquiry lessons per half term, will children be more engaged and motivated?

Context

Summerville is a small urban primary school in a socially deprived area of Salford. This one form entry school includes children speaking several different languages and from over fifteen countries. Children enter Summerville with low levels of literacy across all ethnic groups. Therefore English and Maths has been a priority across the school. Summerville received a 'Good' grading from Ofsted in their most recent report.

The focus for this study was a mixed group of six children from Year 2 with poor lower language, oracy and vocabulary skills. They were identified so that the positive impact of practical science on oracy and language acquisition could be demonstrated.

Issues addressed

One of the next steps identified in the most recent Ofsted report was to focus on the wider curriculum. Due to the focus on accelerating progress in English and Maths, the science curriculum has led to a more literacy based.

Book scrutiny showed insufficient practical science taking place in school and progression in science was not consistent. Discussions with staff highlighted a lack of confidence in delivering practical science. After a whole school science project staff were more confident and motivated.

Pupil questionnaires showed that pupil enjoyed practical lessons in science and found them more engaging.

Review of literature

Primary Science: Is It Missing Out? – The Welcome Trust: This includes recommendations to reinvigorate primary science. The trust observed, 'Children start to develop perceptions about whether science is 'for them' towards the end of primary school. It is therefore essential that all primary school pupils experience inspiring science that builds their understanding of the value and place of science in their lives.'

Do active learning opportunities increase engagement of pupils in science learning? By Tiffany Thomas on the EEENET website. This is directly related to our study and found that children, 'were more engaged overall when lessons were active and creative.'

Maintaining Curiosity. A survey into science education in schools: Ofsted 2013 In the executive summary of this report it states that, 'This report highlights the importance of teaching science for understanding. For pupils to achieve well in science, they must not only acquire the necessary knowledge, but also understand its value, enjoy the experience of working scientifically, and sustain their interest in learning it.'

Research methods

- Pupil voice questionnaire was completed at the beginning and end of project.
- During lessons the teacher observed children's engagement and attitude. Focus group shared their learning and enjoyment of science enquiry using ipads.
- Book scrutiny to evaluate the amount of practical science across the school and the impact of InSET sessions in increasing/improving provision.

Findings before intervention

Children were not actively engaged in scientific learning and struggled to find words to express their knowledge as well as having poor subject specific vocabulary. An example of this was when child M struggled to describe her painting of a tree because she didn't know the word for trunk.

Summerville Primary School

Findings after intervention

All children engaged in scientific enquiry, by exploring the world around them and were motivated to investigate minibeasts in the school environment. The activities challenged the learners to articulate their understanding in different ways. Observation showed that although children were interested in the scientific learning they were not able to express themselves clearly using scientific knowledge. This could be due to low confidence as well as poor vocabulary.

When presenting their understanding in small groups and in front of their peers, the focus children were reluctant to use new vocabulary but when questioned further children had a simple understanding of the terminology.

In the questionnaire at the start of the research the focus children had difficulty identifying what was science and what they had learnt in science. They displayed a lack of clarity and basic knowledge of science content. They used generic terms such as 'stuff' and 'thingy' to explain what they had done in science.

Following the research and intervention the children's responses in the questionnaire showed a clearer understanding of what science is. Child A stood out as being particularly engaged and motivated when talking about scientific enquiry commenting that it can be done at home and at school. Overall they demonstrated improved oracy and understanding although, their vocabulary was still limited.

The whole school questionnaire showed better understanding of science initially in comparison to the focus group, it also demonstrated that children enjoyed practical science and would like to do more. After staff training and a whole school science project pupils and staff were more motivated and engaged.

Whole school book scrutiny showed an increase in the number of scientific enquiries completed in each year group since staff training and a whole school science project. As the project was a whole school enquiry there was a consistency in approach and delivery which supported good outcomes across the school.

Intervention

- A series of scientific enquiry lessons focused on engagement, practical exploration and application of skills.
- Using scientific equipment.
- Observation and targeted questioning of focus pupils.
- Children presenting their learning and articulating their understanding using ipads.
- Focus pupils worked alongside their more able and articulate peers.
- Before and after pupil voice questionnaire.
- Staff science training.
- Whole school book scrutiny.

Implications for future practice

- Research methodologies for integrating vocabulary acquisition into the curriculum.
- Consider a more structured and systematic approach to teaching vocabulary across the curriculum.
- Ensure subject specific vocabulary is taught as part of the scientific curriculum.
- More sustained teaching of scientific enquiry.
- Consider teaching science as a discreet subject.
- More training on working scientifically.

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