

If we change our approach to include open-ended activities in science, will it improve the children's attitudes towards their written work and their outcomes?



Introduction/Context:

Alexandra Park Primary is a two-form entry school in Edgeley, Stockport. There are 414 pupils on roll with 23% of the children classed as pupil premium and 18% with Special Educational Needs or Disability (SEND).

This action research focused on 10 pupils (6 male and 4 female) from one Year 4 class. Although the ten pupils were chosen at random, children identified as SEND, and children working within the Greater Depth Standard (GDS), were excluded from the selection process. This was to ensure that any changes recorded were applicable to the majority of the class. It may take some SEND children longer than 6 lessons to adjust to new methods and, conversely, it could be argued that GDS children might show improved attitudes and outcomes that would not be present in children who find learning more difficult.

The specific class was chosen as the science subject lead, and researcher, is the teacher in this class. This allowed tighter control over the lesson content.

The 'problem' or issue you have addressed

A science book scrutiny, and a recent Ofsted inspection, identified a number of issues with the way that children were recording their learning in their books. The issues highlighted were:

- Care in presentation was lower when compared to English and Maths books.
- It was difficult to identify a child's ability, as all children were producing similar levels of work.
- An over-reliance on worksheets.
- A lack of challenge

Review of current practice and literature

In 2013, Ofsted found that although worksheets were commonly used in science lessons, these often prevented children 'from thinking for themselves.' In addition, they also found a negative impact on independent learning if children were denied the chance to choose how to record their learning. In conclusion, they also stated that a large number of science lessons lacked enough differentiation. It was this idea of passivity in pupils that led us to Bianchi and Feasey (2010) who stated that active learning took place when teachers 'challenge children to think for themselves and present open-ended situations.' They also argued that access to extension activities should not be limited to high achievers, but should be available to all children. However, Graham (2003) highlighted that when you remove these scaffolds, and give children more freedom, there may be an initial decrease in the standard of work children produce. Our research explored whether this would happen and, if so, how long this initial decrease would last.

Research methods:

Data was collected pre-intervention and post-intervention using the following qualitative methods:

- Book scrutiny
- Questionnaires
- Semi-structured interviews with a focus group

Findings before intervention

To establish our current situation, we: performed a book scrutiny to evaluate written work before the intervention; held a focus group where the teacher asked the children a set of planned questions which they answered orally and the teacher recorded; and each child completed a questionnaire.

The book scrutiny demonstrated that the written work and recordings in the books of higher achieving children with a strong depth of knowledge were indistinguishable from lower achieving children or those with an average understanding. When comparing books, it was clear that the work children presented in their science books was of a significantly lower standard than that found in their English books.

Results from the questionnaire show that 100% of the children are proud of the work they produce in their science book and 90% feel challenged to show their best work.

The focus group revealed that 70% of the children preferred working on a worksheet because it is faster, and 'you have to think more when you write straight into your book.'

Findings after intervention

The main findings can be seen when comparing the work in the children's books. The written outcomes in their book shows more clearly each child's understanding of the topic.

The questionnaire revealed that now only 80% of the children are proud of the work they produce in their science book. This indicates that their attitude towards their work may have been negatively affected by the intervention.

Another interesting finding linked to the children's attitude is highlighted in the focus group. It showed that now only 50% of the children prefer to complete work on a worksheet. Children said that they had more room to complete their work in their book as opposed to a worksheet.

Intervention:

We planned a series of six lessons around the unit of sound in Year 4. Lessons were designed to provide open-ended tasks for children to complete, most of which included a "challenge by choice". This was defined as a set of two or three objectives within a lesson which enabled the children a degree of choice in what they did, how they did it and how they recorded it in their science book.

In the first lesson, children were shown examples of written work from other children's science books and were asked to give feedback on it. The purpose was to give children clear examples of what good pieces of written work could look like, including children's own diagrams and writing. The examples used clearly demonstrated that not every child's work would have to be the same or be recorded in the same way, unlike with some of the worksheets used previously.

Implications for future Practice/ Lessons Learned

One of the main findings this study has shown is that some children are less proud of their work. This could be explained by the thoughts of Graham (2003) but this would need to be investigated further. Our new hypothesis is that, given more time, children would see the progress they are making as it would be evident in their books. This should give them the sense of pride that we have already established they have with their English books.

Another interesting finding from the study was how the children's attitude towards worksheets changed over the course of the intervention. It is our belief that the teachers' reliance on worksheets was based on the misconception that children were being supported to develop their practical understanding as suggested by Ofsted (2013). Findings from the book scrutiny after the intervention indicate that providing more open-ended tasks improves the outcomes for all children but also highlights the differences in understanding between the more and less able. Following this research, we will continue to employ more open-ended tasks in science and move away from worksheets in order to monitor the changes in the children's attitudes towards written work and their outcomes.