Improving the opportunity to understand what ‘good’ is and being given time to do so. Improving realization of where I am through traffic light. Improving attitude and motivation by being encouraged to think and reflect. Improving motivation through cyclical self-reflection. I have become better at juggling the many purposes of being a science teacher whilst also improving more general learning dispositions. It was evident from being in the classroom and talking to the pupils that they were more positive about completing class work and tests. However, I have not been able to show, however, that these strategies improved pupils’ test performance over the course of three terms. Whilst thinking about learning more generally has been found to motivate pupils, the thinking needs to be ‘…patient, unthinking attention to immediate experience’ (Claxton, 2009: 183) rather than completion of a highly demanding task. I have not been able to show, however, that these strategies improved pupils’ test performance over the course of three terms. It was evident from being in the classroom and talking to the pupils that they were more positive about completing class work. Important to me, was a feeling that I had been able to address an imbalance between formative and summative assessment that I had felt before embarking on the three action research cycles. I have become better at juggling the many purposes of being a science teacher whilst also improving more general learning dispositions, such as resilience and reciprocity, of pupils in a secondary comprehensive school in 2013.

The Purpose A consequence of my focus on KS4 summative assessment is that pupils can become demotivated, having a low self-esteem and a low self-confidence. Pupils who have a ‘fixed theory of self’ (Dweck and Leggett, 1988) see their failure as being due to something inherently defective in them; consequently, they give up on learning and withdraw themselves from the learning process (Black and William, 1998). I wanted to improve the confidence and motivation of a Year 10 group of students who were apparently feeling frustrated and demotivated. My research questions: 1. What is the purpose of Key Stage 4 science education in the second decade of the 21st century? 2. To what extent do current teaching and assessment practices meet this purpose? 3. Will reform of Key Stage 4 science require changes to these practices? If so, in what ways? 4. In what ways and to what extent can formative assessment offer a way forward?

Action Research Cycles Cycle 1: Strategies focussed on enabling pupils to understand what ‘good’ is in science through making notebuilders, talking for learning and encouraging pupils to think about science through the use of hinge questioning. Cycle 2: Notebuilders were further refined to allow cyclical self-reflection. These also incorporated traffic-lighting. On suggestion from pupils, a three-weekly test schedule was cancelled in favour of formative tests. Cycle 3: Notebuilders were further refined. To encourage pupils to think regularly about learning, tasks based on a revised Blooms Taxonomy (Krathwohl, 2002) were collaboratively designed and then implemented with the pupils. Data was collected through a research diary, pupil interviews, test scores and scrutiny of pupil research diaries, pupil interviews, data collections from class tests.

Collaboration and Intervention Strategies Following pupil interviews and literature searches, an intervention to improve pupil motivation through formative assessment was designed. Techniques from AfL that were synonymous with improved metacognitive skills and learning dispositions of positive reciprocity and resilience were selected. The strategies used, their subsequent analyses and evaluations were carried out in close collaboration with two colleagues in my department. Four intervention strategies were designed based on literature searches and the ideas, experiences and expertise of the collaborators: 1. Improving the opportunity to understand what ‘good’ is and being given time to do this 2. Improving motivation through cyclical self-reflection 3. Improving realisation of where I am through traffic lighting 4. Improving attitude and motivation by being encouraged to think and talking for learning Resources and classroom techniques for these strategies were developed over three action research cycles.

Talking for Learning

- Come up with a summary that follows the outline:
  - We have learned that....
  - because....
  - ........as well as....
  - ........and to sum up.....

References