Is There Evidence of Curiosity Being Facilitated in Science Lessons in Key Stage 2?

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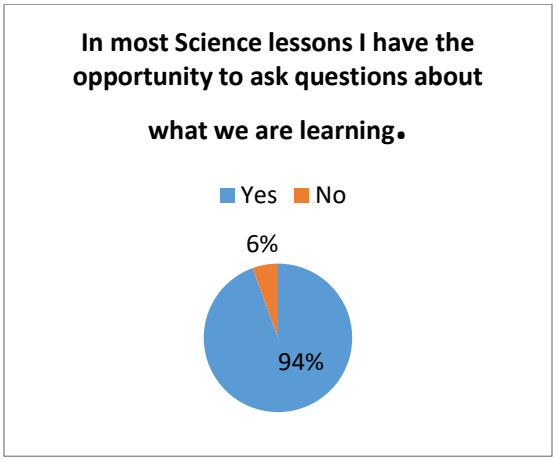
Introduction

Science is boring! Science is too hard! Switched on or off? What makes children look forward to their science lessons? How can we provide a high-quality science education whilst maintaining enthusiasm and enjoyment? The answer…Curiosity! ***Across the lifespan, curiosity serves a broader function of building knowledge, skills, relationships and expertise, curiosity captures people's propensity to stretch their capabilities*** (Izard 1977). Therefore it should be one of the integral founding cornerstones of a successful science curriculum. This exploratory research investigates the following question: Is there evidence of curiosity being facilitated in science lessons in key stage two? This research project has been conducted over the last half term by a member of SLT based in Key Stage 1 and myself. As the science subject lead, I am in a good position to conduct this research because I am in a strong position to effect change. In a school context, there has been a heavy focus on developing the roles of the curriculum leaders and as a consequence I have been supported in engaging in this action research and therefore it has given me the scope to focus on the issues I felt needed exploring. The research question was born through a link with the school's improvement plan, its learning powers agenda and a recent OFSTED report: Maintaining Curiosity: A survey into science education in schools (OFSTED 2013).



Children felt they had adequate opportunities to ask their own questions.

Findings

It is relevant to recognise that these are my findings and here is my personal interpretation of them. The data was interpreted by myself and another teacher, who took part in the design of the research and collection of the data. It is important to note that despite a comprehensive discussion prior to and after the observations the interpretation of each lesson remains partially subjective and this should be realised as a limitation to the findings of this research. In addition the sample size and the frequency of the observations may have limited the validity of the findings as it would have been more beneficial to see the delivery of science across a longer period of time and subjects. However future planning has helped paint a broader picture of the lesson type and activity types to be completed.

Direct Observation

In order to support curiosity, there were several criteria deemed to be essential. Throughout all the observations there were clear trends and patterns noted when identifying these criterion. There was clear evidence of the following being imbedded in planning and practice: differentiation of tasks; science being linked to real-world experiences; cross curricular links; appropriate level of challenge; explicit instructions; and prior knowledge being used to scaffold pupils ideas/questions. In a contrast, the following areas where less evident and appeared infrequently within delivery and planning: the opportunity to work independently; chance for pupils to raise their own questions; child-led planning/questioning; chance to investigate their own ideas; and opportunities for pupils to enhance scientific enquiry skills.

Pupil Questionnaire

The results of the pupil questionnaire fall broadly in line with the findings of the direct observations. Pupils stated that they really enjoy their science lessons and feel they are engaged with the content but saw the gap in their opportunities to work as an individual (expressing they mainly work in groups or partners) and stated they are mostly told what and how to investigate ideas rather than build the skills to investigate their own.

Methodology

It was important to this research that there was a strong focus on what we were looking for in terms of evidence needed to investigate the level of curiosity being facilitated in the classroom. We felt that in order to investigate appropriately we must triangulate research methods to see if the pupils' answers are the same as what was being observed across the lessons and recorded in planning. Therefore, the following research methods were selected: direct observation; pupil questionnaires; and scrutiny of teacher planning. Both the questionnaire and the direct observation capture sheet were created using the research findings of the 2013 OFSTED Report: Maintaining Curiosity. This allowed us to have a degree of confidence in the validity of the questions we were asking and a clear basis for what we were recording in our observations. In addition, we gathered other supporting materials from additional educational resources on how curiosity can be encouraged and considered non-education based literature also. The classes we observed were across Key Stage 2: two year 3/4 classes and two year 5/6 classes. The rationale behind observing two classes in each year group, both delivering the same lessons, was to consider whether or not the level of curiosity being facilitated was due to the opportunities provided through planning or a difference in teaching styles. We felt this would allow us to make a comparison of each class and look at similarities and differences with regard to the direct observation. The sample was also spread across the key stage to see if facilitating curiosity was a theme that was not confined to one year group/unit.

Existing research

Research I have discovered during this process include the afore mentioned report from OFSTED which was designed to help support schools in implementing the new national curriculum. In addition, I drew on the White Rose Research on Stimulating Curiosity to enhance learning (Pluck and Johnson 2011) which outlined the influence of the field of theoretical psychology on the foundations of modern pedagogy. In particular it notes the need for inquiry based learning approaches to motivate students to seek information, which aligns itself with the science curriculum at both primary and secondary level. This research became the basis upon which the pupil questionnaire and the lesson observation capture sheet where created.

Implications for future practice

This research has been shared with teachers and governors of the school. The main findings of this research suggest there is an opportunity for Key Stage Two to develop their facilitation of curiosity through a more consistent approach to putting the pupil's ideas and questioning at the heart of their planning and lesson structure. In addition, pupil's need to be given the time to generate and investigate their own questions, with an aim to improving their enquiry skills and raising their level of engagement. Implications of this research will include a review of science planning at a whole school level and a succession of CPD meetings focused on the implementation of new strategies and an evaluation of their efficacy. As a subject lead, this has helped develop my own professional development and allowed me some much needed time to review not only on the practice of my colleagues but most notably myself. It has allowed me some time to review and compare my own pedagogy to current research methods and has encouraged me to try new strategies. Further research questions that have arisen from this research include: how can we encourage pupil's to lead their own learning? What is the best way to develop scientific enquiry skills independently? Is the facilitation of curiosity different across the Key Stages?