Hudson Road Primary School, Sunderland with Durham University

The Organisation for Economic Co-Operation and Development’s (OECD) Programme for International Student Assessment (PISA) define Scientific literacy as:

"the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity."

Project Aims:
This project seeks to critically evaluate the use of pupil-led, independent science enquiry projects as a tool to develop Y5/6 pupils’ scientific literacy, creative thinking skills and engagement in science. This project requires teachers to transfer responsibility for decision-making to children during open-ended investigations and to review the quality of questioning necessary to prompt children’s productive thinking (Roberts, 2010).

This project will also evaluate how primary teachers can best be supported to facilitate the development of these projects through the delivery of whole staff CPD activities and the implementation of a research protocol.

Research by Newton and Newton (2009) identifies three key points at which primary teachers can intervene to support the development of children’s creative thinking in science. These are:

- encouraging children in their attempts to make sense of the world through more or less speculative descriptions and explanations.
- enabling children to decide how best to collect and evaluate scientific evidence.
- enabling children to apply their scientific knowledge in problem-solving contexts.

Through the development of their own independent science projects Y5/6 pupils will have opportunities to share their ideas, experiment and design ways to collect evidence to validate their scientific hypotheses.

METHODOLOGY

DATA COLLECTION INSTRUMENTS TEACHERS:
- Drawing Tasks
- Pre and Post Project Attitudinal Surveys
- Diary Reflections
- Focus Groups

DATA COLLECTION INSTRUMENTS – PUPILS:
- Drawing Tasks
- Questionnaires
- Children’s Recordings and Representations
- Project Diaries
- Exhibition of Projects

Learning Outcomes – Y5/6 Class Teachers:
- To enable participating teachers to co-construct professional knowledge through the development of collaborative practices.
- To enable teachers to critically reflect on the growth of their professional identities as primary science teachers as they further develop their subject matter knowledge and pedagogical content knowledge bases.
- To develop pupils’ understanding of the critical role of evidence in validating the assumptions and conclusions generated from scientific enquiries by drawing parallels between the work of scientists and professions that actively engage in the collection, analysis, interpretation and evaluation of evidence to inform decision-making.
- To contextualize children’s science projects in real-life experiences, areas of personal interest, stories and history eg Time Team: Victorians, the Great Exhibition of Scientific Discoveries and Inventions at Crystal Palace in 1851.

Learning Outcomes – Pupils:
- To engage with exciting scientific phenomena as real scientists.
- To ask questions, generate hypotheses and test these ideas using experiments.
- To appreciate the role of evidence – its quality and reliability - in enabling scientists to successfully support and challenge hypotheses, through enquiries.
- To plan empirical ways to collect, analyse and interpret evidence.
- To use evidence to support and challenge conclusions.
- To prepare an exhibition of projects using a variety of presentation strategies including role-play.

References

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