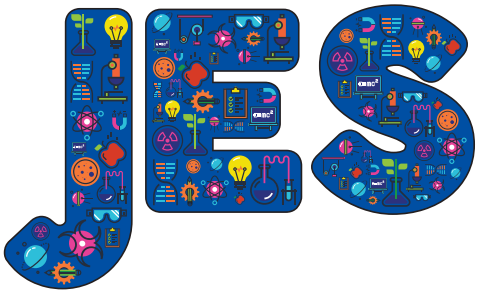
Editorial



● Amanda McCrory ● Suzanne Gatt

We welcome you to this special edition of *JES*, which focuses on practitioner research in the Early Years Foundation Stage (EYFS) and primary classroom; and where researchers of science in teacher education share their theoretical approach and experiences in supporting teachers.

Emerging from presentations made at the PSTT International Primary Science Conference, *No Boundaries, No Barriers,* held in Belfast in June 2016, this edition richly demonstrates how evidenced-based research can significantly improve the provision of science in both the EYFS and Key Stages 1 & 2 (ages 5-11). Certainly, eliciting and maintaining curiosity via exploration and inquiry is a strength of EYFS practitioners, which has been well recognised by Ofsted (2013) and is clearly reflected in the articles presented in this issue.

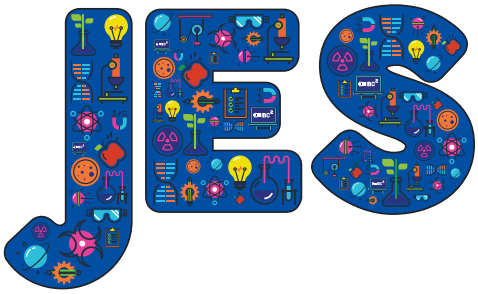
Teachers' professional development is key to bringing about effective change in school science. As many EYFS and primary teachers are aware, implementing inquiry is a great challenge, as it demands the changing of one's own image of science, developing expertise in teaching through inquiry by gradually gaining confidence through practice, and understanding how to use formative evaluation (of personal practice and children's achievement) to improve one's own practice. The journey is long and often time- and energy-consuming. Teaching through inquiry and exploration changes the dynamics of learning. It is not easy to accept working within a framework where there isn't really one correct answer; where you have to refrain from telling and guiding, but instead promote curiosity, inquisitiveness and reflection. And, in addition to all this, you also have to fulfil all the curriculum demands. The articles in this issue shed light on how teachers were supported, and achieved this shift in different ways and to different degrees. The articles make interesting reading, and we encourage you to give yourself a chance as well as time to allow yourself to go through this change gradually.

We hope that you will be inspired by the powerful research in this edition of *JES*; firstly, to undertake practitioner research in your own classroom environment which, as you can see from the articles in this issue, is a rewarding experience both for you, in terms of your continuing professional development, and the children whom you teach! We also hope that, if you are inspired to undertake your own research project based in science education, then you will consider sharing your research outcomes with a wider audience by submitting an article to *JES*, which will also enable you to add to the existing and growing literature on teaching science to 0-11 year olds. Details of how to submit an article to *JES* are available on p 116 of this issue.

We would like to take this opportunity to thank the Primary Science Teaching Trust (PSTT), and particularly the Guest Editor, Professor Deb McGregor, for their enormous contribution to this Winter 2016/17 issue. We wish you happy reading and hope to hear about your achievements and experiences.

Dr. Amanda McCrory and **Professor Suzanne Gatt** are Co-Editors of the *Journal of Emergent Science.* E-mails: a.mccrory@ucl.ac.uk and Suzanne.gatt@um.edu.mt

Guest Editorial



● **Prepared by Deb McGregor**

A special edition

This bumper edition of *JES* contains a collection of articles for the special edition emerging from the June 2016 International Conference of Primary Science held in Belfast, Northern Ireland. The title of the Conference, *No Boundaries No Barriers*, offered an open forum within which to be creative about the focus of the papers and workshops presented. This inaugural international |conference, sponsored by the Primary Science Teaching Trust (PSTT), was well attended by over 380 practitioners, researchers and educationalists working in primary science. The papers included here are all written by teacher-researchers or teacher-education-researchers, with the intention of informing, illuminating or recommending ways to enhance teaching, learning, assessment or leadership of primary science.

Articles focusing on creative practice and the development of literacy and inquiry skills

This special edition begins with the first three papers (Digby, McGregor and McClune) relating to different kinds of practice and the ways in which they support literacy and inquiry skill development with early years, Key Stage 1 (age 5-7) and Key Stage 2 (age 7-11) children.

Digby's paper, *To what extent can Video-Stimulated Reflective Dialogue facilitate the development of practitioner critical reflection and understanding of creativity in scientific inquiry in the early years?* offers a range of useful insights for teachers. She describes how she organised and managed a group of teachers (who worked as mutually supportive colleagues) to consider how inquiry was evidenced in early years education. She adopts the approach of Moyles *et al* (2003) to frame practitioner discussions whilst watching recordings of children playing. Her findings suggest how video-stimulated dialogue can promote pedagogical understanding of different ways to encourage more investigative learning with young children.

McGregor's paper entitled, *Using drama within a STEM context: Developing inquiry skills and appreciating what it is to be a scientist!* also details a particular pedagogy, designed to promote thinking about science. Her project, though, reports on the creative use of drama strategies, rather than written work, to augment children's understanding about the processes of scientific inquiry within a technological context. Her innovative work using drama places children in role as scientists, so they are encouraged to *work scientifically.* Her findings suggest how the application of dramatic conventions can achieve what Ofsted (2013: pp.10-11) recognises is at its *'highest where pupils were involved in planning, carrying out and evaluating investigations that, in some part, they had suggested themselves'.*

McClune discusses *Committing curriculum time to science literacy: the benefits from science-based media resources*. He describes how different pedagogic strategies, used in a creative way to promote literacy skills with Year 6 (age 11) children, can support criticality in reading. His study examines how authentic material, such as text presented in the media, can be adopted and used as a learning resource. His findings corroborate Norris & Phillip's (2003) view that literacy in its fundamental sense is central to scientific literacy, and suggest that the innovative approaches used to engage and guide the children to carefully consider media reports can facilitate them in recognising links between claims and evidence in relation to the trustworthiness of a report.

Articles focusing on assessment in primary classrooms

Earle's paper, *The challenge of balancing key principles in teacher assessment*, clearly and

insightfully articulates the various issues teachers need to consider (and balance) when endeavouring to validate and verify their assessments of children's work. She imaginatively applies a metaphor of a seesaw to illustrate the relationship between validation, that is, ensuring measures of children's attainment are robust and repeatable, with the contrasting issue of verification, ensuring there is substantive and comprehensive evidence that is practicable to assimilate. She also includes in her theorisation concerns about balancing moderation and manageability.

The Serret *et al* paper, *Transforming assessment and teaching practices in science inquiry,* highlights the various forms that professional development can take and describes how teachers might be supported to better understand inquiry in European contexts. The article illustrates rather eloquently how the scrutiny of transcripts from differentiated inquiries (Wenning, 2005), which are subsequently discussed by teachers, can offer insights into classroom practices that augment professional development and further understanding of science teaching and learning processes.

Articles focusing on science leadership

McCullagh & Doherty's paper reporting on *Innovative approaches within Initial Teacher Education to develop emergent science leaders* suggests how a fresh approach to teacher education could address concerns related to the reduced time spent on science in the primary curriculum. They discuss how their 'Student Teachers' College' project, which requires pre-service teachers to demonstrate their competence in four areas: excellence in classroom teaching; peer dissemination; professional development activity with schools and science education agencies; and practice-related research, can facilitate subject leadership skills.

The paper by Mackintosh *et al*, *Developing teachers as leaders of science in primary schools,* considers how the Primary Science Quality Mark (PSQM) award programme can be utilised as a way of addressing the reported decline in the status of science in primary schools. They draw on Fairman and MacKenzie's 'Nine Spheres' (2012) model to suggest the range of leadership skills that are useful for science leaders. Their findings exploring the impact of PSQM suggest how science leaders' perspectives can be shifted from science learning and practice in isolated classrooms to a whole-school vision.

Bianchi's paper, *A trajectory for the development of teacher leadership in science education,* offers a theoretical model that can be applied to inform CPD. There are five stages of the developmental model, which are described, justified and illustrated through rich descriptive reflections from teachers and teacher educators. The article contributes to the literature on teacher development by considering the various (and often sequential) processes essential for effective CPD.

Scientist-teacher collaboration: exploring the nature of successful STEM placements in primary schools by Choudry *et al* highlights quite unique insights into the processes and outcomes of STEM volunteers working alongside primary science teachers. The reflections of the volunteers on their experiences are provided in much detail, clearly detailing how each reaps greater or lesser rewards. The challenges and benefits of the programme are discussed and reflected upon to suggest how schools might make more effective use of them in future endeavours.

Articles considering transition from primary to secondary science classes

Howard's paper, *Exploring the use of inquiry-based science pedagogies across primary-secondary transition: How does the literature relate this to the declining uptake of science in secondary schools?* considers what the research suggests about the key issues. She highlights that how the subject is taught influences the nature of pupil engagement, subsequent learning and the development of an individual's scientific identity. She suggests that we still need to pay attention to the Rocard report (2007), which identified how inquiry-based science education (IBSE) is still relevant. This is because children like science as they get to carry out experiments and they love investigating, frequently saying, *'You learn loads when you do it yourself, like Science days when you do experiments and don't copy up work'* (Hopkins 2008: pp.397–8).

Finally, Coppard's paper, *What does a review of the literature suggest about the teaching of the nature*

and behaviour of matter during the transition years from primary to secondary? critically examines key ideas from the research literature. She discusses what we know from various research studies about the nature and behaviour of matter in Key Stages 2 and 3 (ages 7-14). She offers an argument that suggests the current approach often fails to ensure meaningful learning of the particulate nature of matter and what might be appropriate features of a more successful curriculum model.

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Professor Deb McGregor, Oxford Brookes University, is the Guest Editor for this edition of *JES*.

No boundaries, No barriers: the PSTT International Primary Science Conference, Belfast, June 2016