Chapter 6
Child-Focused Primary Science Inquiry: Can the Right Balance Be Found Between Creativity, Curriculum Objectives and Assessment Requirements?

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6.1 Introduction

For many, creativity and assessment pull in opposite directions, with creative approaches designed to open out possibilities, and assessment of curriculum objectives designed to narrow attention to more comparable outcomes. In this chapter we will explore the relationship between science inquiry, creativity and assessment. We will share two case studies of ongoing primary science projects from the UK, which aim to foster creative science inquiry, within the curriculum and assessment framework. Conclusions for practice will be drawn regarding supporting teachers to maintain the balance between creativity, curriculum and assessment in the classroom.

6.2 Science Inquiry

'Inquiry' or 'to enquire' means 'to ask' and is inherent in the way humans think about the world around them. From a young age, children will use facial expression and sound to seek a response and develop the skill of question-asking, which through practice and modelling underpins the process of inquiry, and the way scientists work. Harlen (2018) identifies a scientific inquiry as one that "concerns questions about the natural and made world and leads to the developing understanding

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of what is there around us" (p. 33). Science inquiry involves raising questions and gathering evidence to answer those questions.

Inquiry is inherent in the concept of scientific literacy, whereby a person demonstrates a range of competences, knowledge and attitudes that enables them to engage with science-related issues and with the ideas of science (OECD, 2013). A scientifically literate person is able to:

1. Explain phenomena scientifically:
    - Recognise, offer, and evaluate explanations for a range of natural and technological phenomena.
2. Evaluate and design scientific inquiry:
    - Describe and appraise scientific investigations and propose ways of addressing questions scientifically.
3. Interpret evidence and data scientifically:
    - Analyse and evaluate scientific information, claims, and arguments in a variety of representations and draw appropriate conclusions.

(OECD, 2013, p. 7)

In England, scientific inquiry is an explicit part of the National Curriculum, with objectives listed under a 'Working Scientifically' section (DfE, 2013). The curriculum states that inquiry "must always be taught through and clearly related to the teaching of substantive science content in the programme of study" (DfE, 2013, p. 5), meaning that inquiry is taught as part of topics within biology, chemistry and physics such as: plants, everyday materials and electricity. By placing inquiry in context, rather than as a stand-alone 'wow' moment, the aim is to support the meaningful development of both process skills and conceptual understanding, avoiding surface level 'activity-led' engagement (Ofsted, 2019). Ideally, this approach would enable teaching activities to move beyond demonstrations and support children to apply their learning through investigations within which they have autonomy. However, an investigation may become more teacher-led where children are 'recipe' following to get to the 'right' conclusion, for example, if the aim is to illustrate a particular concept. Curriculum sequencing is integral here, with decisions to be made around whether child-led investigations should follow lessons on 'substantive content', or whether exploratory inquiries are utilised to build understanding of the world around us.

In England, the time available for science is often limited due to pressures to focus on English and mathematics, which form the basis of national school performance indicators (Wellcome Trust, 2017). Time pressures due to performativity culture (Davies et al., 2013) are compounded by the need to 'get through' the National Curriculum content, meaning the opportunities for creative inquiry are curtailed (Davies et al., 2018).

6.3 Creativity

Creativity is a complex concept and one which lacks a widely agreed definition (Mullet et al., 2016). However, in this chapter we are particularly focused on the difference between creative teaching and creative learning (Davies et al., 2014). Davies, Newton et al. (2018) found that when asked about creativity in the classroom, most teachers in the study described a creative experience, topic or provocation for the children, which signifies creativity on the part of the teacher rather than creativity on the part of the child. In contrast, creative learning, with divergent thinking processes that encourage child agency, is the focus for this chapter.

When considering children's creativity in science, we do not suggest that these are discoveries that are new for humankind, but the exploration which provokes new thinking for the child. Cremin et al. (2015) define this as 'little-c' creativity "purposive imaginative activity generating outcomes that are original and valuable in relation to the learner" (p. 416).

This invitation and opening out of children's scientific ideas and possibilities points to the creative and divergent thinking which can be developed as part of science inquiry. Although it should be noted that teachers may need to be persuaded of the creativity inherent in the scientific process, since many teachers see creativity as a feature of 'arts-based' subjects (Mullet et al., 2016), with a focus on a creative product rather than the creative process.

Craft et al. (2012) describe how 'possibility thinking', where options are introduced by and with the child, can result in the child taking a leading role in their learning. They explain that adults may provide a frame by setting up an environment, yet if the child initiates the line of inquiry and develops the possibilities, they are the leading agent in the creative learning process. Furthermore, Cremin et al. (2015) highlight the debate in the literature regarding whether a teacher is constraining or enabling when they scaffold children's inquiries (p. 408). Craft et al. (2012) discuss this 'meddling in the middle' to be when the adult must seek to balance co-authoring with standing back and allowing the children to fully lead, as such treading a fine line between scaffolding and taking control. The optimum role for the adult will vary depending on the age and experience of the child, together with the teacher's aims for the interaction.

6.4 Creativity in the Science Inquiry Process

Although creative processes are inherent in the inquiry process, it may not be explicitly recognised where or how the child is creatively or imaginatively engaged in the process of working scientifically. The primary science inquiry process can be seen as a cycle, with exploration and investigation leading to further questions. The inquiry process can be simplified to a 'Plan-Do-Review' Cycle (TAPS, 2021) to provide teachers and children with a step-by-step approach to questioning and

Fig. 6.1 The science inquiry process in a 'Working Scientifically Wheel' (TAPS, 2021)

planning, setting up enquiries, observing and measuring, recording, interpreting and reporting and evaluating (Fig. 6.1).

The science inquiry process can be contrasted with the aligned discipline of engineering. In this discipline a problem-based learning approach draws the learner towards asking questions, imagining possibilities, planning and creating solutions that can then be tested and improved.

Whether considering a science inquiry Plan-Do-Review cycle, or an engineering design cycle, there are opportunities for 'little-c' creativity throughout (Cremin et al., 2015), with divergent thinking encouraged to create new solutions or methods. However, in the reality of the primary science classroom, such opportunities may not be explicitly described as creative, or creativity used as an undefined or overarching concept. Although creative learning is often a genuine aspiration, it risks being an assumed outcome for children, and not explicitly discussed or described in science lesson planning. The value of science inquiry is that it provides stimulus for creative thinking to be encouraged, manifesting itself in the ways that children can be more agentic in inquiry activities, have more opportunities for decision making and possibility thinking (Craft et al., 2012).

Creativity in primary science requires enough freedom for children to make decisions (Murcia et al., 2020), thus child agency has a key role to play here. Lucas and Spencer's (2017) five-dimensional model of creativity includes: being inquisitive, persistent, collaborative, disciplined and imaginative as elements. Within each dimension they describe how individuals would behave and act, although it is notable that 'decision-making' does not feature within their frame. We propose that children's decision-making is key to creativity in primary science, supporting them to engage creatively in their science inquiries.

Whether an inquiry is more child-led or teacher-led is dependent on who is making the decisions about how it will be carried out in the classroom. Correia and Harrison (2020, p. 371) describe three categories of pedagogical approach:

- Directed – teacher leads inquiry and decision-making.
- Guided – child as apprentice, with opportunities for decision-making.
- Independent – child leads inquiry and decision-making.

This classification is useful because it draws attention to child agency, noting that how: "teachers introduce and organise inquiry in their classrooms affects the degree of autonomy and choice that the learner is allowed to exhibit within the inquiry activity" (ibid. p. 358). With a guided inquiry approach, opportunities for children's creativity in inquiry can be planned for, with the teacher mapping out in advance elements which will be open choice and curriculum elements which will be scaffolded for the children. Children can demonstrate and develop scientific habits of mind and creative thinking in inquiry when there are planned opportunities to make choices and decisions of their own. What such a guided inquiry approach can look like in the classroom will be explored through consideration of the GSSfS and TAPS projects.

6.5 Science Inquiry and Assessment

In England, science inquiry is assessed using the National Curriculum for Science (DfE, 2013) which lists objectives that need to be taught in blocks of two or three years (Key Stages). These objectives act as the assessment indicators for teachers to judge whether the children are 'meeting age-related expectations'. Such classroom assessment may be used summatively for reporting purposes, or formatively to support learning (Assessment Reform Group, 1999; Gardner et al., 2010; Wiliam, 2018). The 2013 curriculum objectives replaced a previous system of levels (DES, 1988) which contained larger progressive summative descriptions. Whilst the 2013 curriculum objectives are more specific, they are also numerous, which can make it difficult for teachers to judge whether children are 'meeting expectations' in so many areas. There are also ongoing concerns regarding a lack of assessment expertise in the profession (Gardner, 2007), with a lack of experience and guidance for teacher assessment leading to reliance on tests which focus on the more easily comparable factual information, rather than the inquiry process.

Inquiry can encourage children to generate and explore ideas leading down many avenues of new learning, however, the freedoms that it creates for children to pursue different lines of inquiry can appear to challenge teaching approaches aligned to knowledge-led curriculum objectives. English schools also often have complex data tracking systems which require regular input of summative data, leading to the undervaluing of formative assessment as frequent summative 'testing' continues to dominate (Mansell et al., 2009). National school accountability measures have arguably resulted in narrow comparisons between outcomes for children and schools. In order to compare children's learning across schools reliably, the outcomes need to be clearly defined, which may be contrary to creative inquiry which is more likely to lead to diverse outcomes.

Nevertheless, whilst creative science inquiry is not 'easy' to assess, it is more manageable when there is a shared understanding of its features (Harlen, 2013). Building such a shared understanding can mean that teachers are more confident and informed to plan opportunities for children to be actively involved in inquiry (Serret et al., 2018). Refining teaching practice in this way would seek to develop children's autonomy and decision-making skills, and address curriculum and assessment requirements. In this chapter, we argue that it is possible to find such a balance between the demands of creative science inquiry, curriculum and assessment.

A further tension in assessment, which is at the core of the creativity debate, is how open (divergent) or closed (convergent) an assessment can be (Torrance and Prior, 1998). Divergent assessment supports a creative approach, it is where children are asked to share what they know, understand or can do; for example, eliciting ideas about living things or selecting materials for an open-ended inquiry. Such activities will have divergent outcomes as the children's ideas could go in many directions. This provides useful information to assess a child's starting point, but makes comparison between children harder. In contrast, convergent assessment aims to find out if children know, understand or can do a particular thing; for example, whether the children know the names for the parts of a plant or that only one variable is changed in a fair test. These activity outcomes are likely to look similar, with labels for root, stem, leaf and flower identical across the class for those who answer correctly. This closed assessment helps to 'tick off' curriculum objectives or assessment criteria, but may not show in-depth understanding or be suitable for the more creative aspects of inquiry such as raising questions.

Both divergent and convergent assessment activities can be utilised in the *creative* classroom, the debate is perhaps whether priority should be given to each style at different points in the topic sequence. There is also the question of whether there is something in between divergent and convergent, a more guided or focused approach, as will be discussed below.

6.6 Creative Scientific Inquiry in Practice: Two Case Studies

In order to explore creative scientific inquiry in practice, examples are drawn from two UK primary science projects. Firstly, the *Great Science Share for Schools* (GSSfS) is exemplified by responses selected from a survey of 152 teachers. Secondly, 142 teacher survey responses are explored from the *Teacher Assessment in Primary Science* (TAPS) project. Each project and its data collection methods and key findings will be introduced in turn.

6.7 Supporting Inquiry in the Great Science Share for Schools (GSSfS)

The GSSfS (https://www.greatscienceshare.org) is an annual campaign that has been designed and developed by the Science & Engineering Education Research and Innovation Hub at The University of Manchester. Created in 2014, this campaign is designed to raise the profile of child-focused primary science by engaging teachers and children in an annual campaign that requires them to undertake and communicate the outcomes to science inquiries. This is facilitated through face-to-face or on-line sharing of children's own scientific questions, where they are invited to communicate their activity with new audiences, including peers, adults, community members, or the general public.

GSSfS has become a recognised part of the school calendar in many UK schools, adding value through its focused promotion on providing stimulus for children to be given opportunities to ask, investigate and share their own scientific questions. The campaign is inclusive and non-competitive which has resulted in children from 5–14 years being supported in school by teachers to spend more time on science inquiry within curriculum time, which has also extended to home learning. The focus on children taking the lead in asking and sharing their scientific questions promotes children to be agentic in their approach, often supported by teachers who co-author and support the planning and undertaking of the inquiry itself.

We are including this campaign as an example of where we have seen a shift in approach by teachers from directed science inquiry to guided and independent inquiry. Survey and case study data is collected annually, using a post-campaign evaluation on-line questionnaire that seeks the responses from teachers or educators who have registered children's involvement. In addition, children are encouraged to share basic outlines of their inquiry plan and outcomes that offer insight into the nature and context for the scientific inquiries they have designed and led. The case examples used here to exemplify children's science inquiries are selected from over 250 questions submitted via the campaign website during the 2020 campaign.

6.7.1 Findings from the GSSfS

The following few examples are selected to offer insight into the guided nature of children's inquiry experiences.

> Aged 4, Sammy explored the question "Would a stickman drawn in a bowl with a whiteboard marker wash away?" She explained that, "My mummy and me drew a stickman on the bottom of the bowl with a whiteboard marker. She then slowly helped me tip some water inside the bowl and covered the stickman." Together they found out that, "When the water was poured over the stickman, it lifted from the bottom of the bowl. The stick man stayed whole and floated. When I shook the bowl it looked like the stickman was dancing." Further going on to ask, "What made it float?"

> Aged 8, Alex explained that he had noticed that his pennies were dirty. He questioned, "How do I make my pennies clean?" and described, "I am going to put coins into different liquids. I predict that lemon would clean the best and I think that coke will clean the worst." He explained that "I got 6 pennies from the same year (2006). I labelled 6 cups with 6 different liquids; lemon, coke, milk, water, hand soap and vinegar. I put a coin into each liquid and waited for 30 minutes. I then removed them and wiped to get the liquid off. I found that the lemon and hand soap cleaned the most. I would like to know why lemon and hand soap cleans pennies the best? I also would like to know how long will my pennies stay shiny for and why do they go dull?"

> Aged 11, Jo, asked "Are rainbows real?" and investigated this as follows—"I used a glass of water, a pencil, white paper and a torch. First, I dipped the end of the pencil in the water. It appeared to bend and look bigger. Then I put a glass which was half filled with water on the edge of a chair. I put white paper on the floor and shone my torch through the glass of water and onto the paper. IT WAS AMAZING! I made a rainbow. The water bent the light from my torch and split it into colours of the rainbow, just like rain does. I honestly didn't think it would be that easy. So yes, rainbows ARE real even though we can't touch them."

In these examples, we can see scientific habits and skills developed in school settings being applied to questions that the children had interest to explore. The focus of the GSSfS on encouraging children to explore 'their own' questions has seen a move to teachers giving more opportunity for children to do this. Evaluation reports undertaken in 2019 surveyed participating teacher experiences of the campaign using an on-line questionnaire. This sought to identify the type of activity undertaken and teacher's impression of the impact of the GSSfS campaign on children's science learning experiences (LookOut, 2019). Responses gathered from 155 teachers, reflected that 86 per cent of teachers agreed that the science investigations conducted as a part of GSSfS were more child led than those regularly done in school. Teacher post-campaign interview findings as part of this evaluation demonstrate the mix of decision making between children and teachers in the inquiries undertaken. Teachers explained that the choice of which science investigation and method was a joint decision between them and children, however teachers encouraged children to make the final decision about resources and approach. They recognised that there were 'naturally occasions where this needs to be guided' and that teachers reported that it was, "essential that children make their own decisions and be allowed to make their own mistakes" (ibid. p. 18).

When explaining teaching approaches used to engage in the GSSfS, some described tools such as 'question boards'. This was a teacher-designed approach in which children are encouraged to ask questions about science and the question board offers an opportunity to post any and all questions that children ask so that they do not get missed or forgotten when falling outside a lesson in which they can be addressed. If a question cannot be discussed there and then, it is written up on a sticky note and posted on the question board. These questions are then dealt with at a specific time in the week, which may include discussion of how and why the question was posed, where an investigation should take place, what type of investigation or inquiry should be used to answer it and what variables should be measured.

Table 6.1 illustrates outcomes when teachers were asked to rank the impact that participating in the GSSfS had on six different areas. From this it is notable that

Table 6.1 Teacher rankings of the impact of GSSfS

Statements	Average impact ranking (0 = none; 5 = high)
Your (teacher) knowledge and understanding about asking scientific questions	3.3
The profile of science questions in your school	4.4
The opportunities for children to ask their own scientific questions in your classroom	4.6
The engagement of parents/community with science in your school	4.0
Children's science attainment	3.8
Children's aspirations towards science	4.4

teachers reported positive influence it had on encouraging children to ask their own scientific questions in the classroom.

Offering children greater opportunity to take a lead in the science investigation is a positive outcome of the campaign. In accordance with Correia and Harrison's (2020) suggestions, most teachers explained that they actively pursued a collaborative approach with the children, which is also reflected in Fig. 6.2.

What has not yet been discussed with this group of teachers is the ease or difficulty of adopting a partially negotiated approach to children designing their own science inquiry for assessment judgements. GSSfS has focused on supporting inquiry to take place, rather than assessment, although inevitably this is a rich opportunity in which teacher assessment can take place.

6.8 The Teacher Assessment in Primary Science (TAPS) Project

The TAPS (https://pstt.org.uk/resources/curriculum-materials/assessment) project, funded by the Primary Science Teaching Trust, has been working collaboratively with teachers across the UK since 2013 to develop support for valid, reliable and manageable assessment. A key part of the project has considered a Focused Assessment approach, whereby an element like planning or conclusions is selected as a focus within the context of a whole inquiry. It is the focused element which is recorded by the children, for example, completing an inquiry plan, making a prediction on a post-it note, drawing a graph or writing an evaluation. By focusing the child's recording and teacher observation or judgements on one element of the inquiry, the practical inquiry becomes more manageable for teachers. It also helps to enable some of the decision-making to be handed over to the children. For example, if the focus is on evaluating, then the children can be encouraged to try out their own ideas for the inquiry, making their evaluations more meaningful. Whilst, if the focus is on drawing results tables, then children might need to be supported to carry

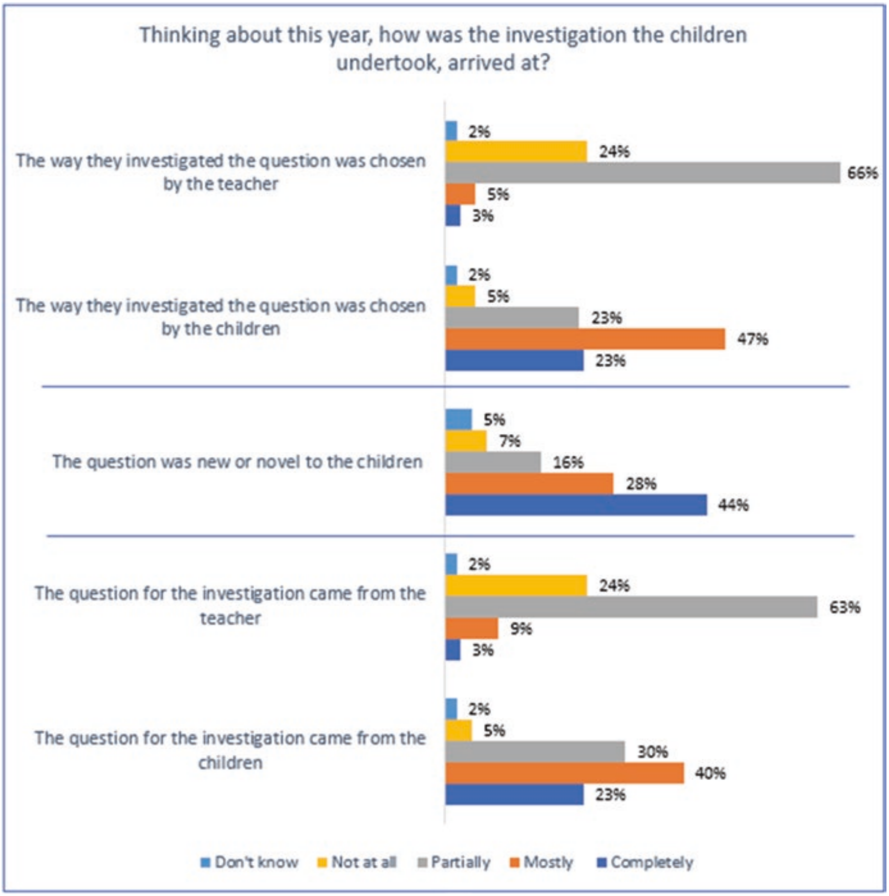

Fig. 6.2 Teacher reflections on child-led nature of GSSfS investigations

out an inquiry which results in numerical data, but could make their own decisions about which variable to change or which area to survey.

This Focused Assessment approach includes a mix of convergent and divergent elements, for instance, where the clarity of the results table meets agreed (convergent) success criteria, but the inquiry findings or way it was carried out may be quite different (divergent). A practical example is a 'craters' investigation (dropping balls into sand to mimic meteors hitting the moon), where the expectation of a completed results table could be fulfilled, whilst still giving the children choice about whether they change the height or size of the ball, etc., and whether they measure the diameter or depth of the crater. This could be described as a type of guided inquiry, with a convergent element included to support assessment judgements, whilst other more divergent elements mean that children are able to take an active role in decision making.

The TAPS Focused Assessment approach is being tested and refined in practice. The approach was introduced to primary school teachers (for children aged 4–11) in nine regions across England on a two-day training course. After Day 1 (Sep–Oct 2019), the teachers were asked to carry out an inquiry lesson with their class. On Day 2 (Jan–Feb 2020), they completed a feedback form detailing their experience.

6.8.1 Findings from the TAPS Project

One question asked the teachers whether they had focused on a Plan, Do or Review element of the inquiry (TAPS, 2021); these answers were tallied to provide a frequency. Responses from teachers (n = 142) indicate that selecting a focus is something which is possible for each element of a science inquiry (Table 6.2).

In order for this approach to be helpful for formative assessment purposes, the teachers need to gain useful information about their children's learning, thus they were asked: "What did you notice/find out about your children? (Any surprises?)" During thematic analysis, a range of themes related to children's science learning and their creativity emerged, which are pertinent to this discussion.

Teacher (T) responses revealed that many had recognised children's agency and decision making as an enabler of creativity, for example:

> They loved the experiments as they were in charge—they could make decisions as it was not me telling them what to do! Their use of scientific language and reasoning was strong—after rocket mice exp, a LA child found a small plastic bottle and I said 'we could have used that for our experiment', to which she replied 'but that wasn't the variable we were testing'. (T46)

> All keen to do practical experiments, some have unique ideas but it was good to test these (e.g. curry powder melts ice because it's hot). (T99)

> Children were given more freedom and autonomy. They rose to the challenge and impressed me with their presentations. (T31)

Some teachers were able to gain useful formative assessment information from the open-ended activities, so that they could decide what to do next, for example:

Table 6.2 Teacher described focus for TAPS inquiry lesson carried out with their class between day 1 and 2 of training (n = 142 from nine regions in England, Jan–Feb 2020)

Described focus for TAPS inquiry lesson	Frequency
Plan focus e.g. asking questions, planning, predicting	43
Do focus e.g. observing, measuring, recording results	43
Review e.g. interpreting, concluding, evaluating, reporting	39
Two areas described	5
Teacher's description unclear	8
Focus on eliciting knowledge rather than inquiry	4

> More children knew certain vocabulary than I anticipated. They enjoyed more independence. Measuring time was more difficult for them than I thought, as well as using an actual stop-watch. (T110)

> Groups of 4 [were] able to carry out investigations with minimum teacher's input by following investigation frames (in particular from planning to recording). Variables was not a concept well understood. (T34)

The 'investigation frames' described by Teacher 34 are a sticky note planning board, where the variables can be moved around to create different fair test inquiries (Goldsworthy et al., 2000). The use of these planning boards were described by 33 teachers in this sample, with many noting how these had created more opportunities for children's decision making. Others found that the Focused Assessment approach was a new way of working for the children and so the class initially struggled to be independent, for example:

> Found 'open' session challenging (T68)

> Early in the year, quite a bit of scaffolding required. Aiming to reduce this as assessment focuses are repeated. (T26)

> They were not given much of an input/support for spinners results—struggled to record their data. Moved on to meteors after discussing results and their results were much clearer and they were able to analyse them. (T87)

These responses could indicate that this is a new way of working which teachers and children may need to develop over time, with more scaffolding or guiding at the beginning of the school year, and support being gradually withdrawn as science inquiry skills develop. A final theme emerging from this data was that the focused assessment approach may support children who have identified special educational needs or those who normally struggle with written reporting in science, for example:

> I focused on specific recording in books which meant that children had a lot less writing to do. I noticed a positive change in the children, especially those that struggle with writing. (T50)

> The children who normally struggle with recording were uninhibited by using post-its and were able to get the most accurate results and observations as a result. (T104)

> Yes! Children who are usually quiet and not able to write very much contributed a lot in their discussions and in the groups. Those who usually complete all their work struggled to link the predictions/questions to the results/conclusion. (T18)

Such comments indicate that the Focused Assessment approach provided teachers with information which they were not expecting, challenging assumptions about children's science learning and their development of creativity.

6.9 Conclusion

Exploration of the GSSfS and TAPS projects have provided the means to test theoretical ideas about enhancing children's 'little c' creativity (Cremin et al., 2015) and agency in inquiry. Through science inquiry models that move towards guided inquiry in primary school settings, there are early indications that children's decision-making and agency can be enhanced within the curriculum requirements, supporting creative thinking (Murcia et al., 2020). Emphasis on children's agency in inquiry could support teachers to move from thinking about creative teaching to creative learning (Davies et al., 2018). It is evident however that there is still an ongoing tension between creative inquiry and curriculum assessment requirements, although these programmes offer inspiration to the possibility of achieving a balance.

Through the work of GSSfS and TAPS, we have found that the following precursors can support teachers to the balance between creative inquiry and curriculum assessment requirements:

- Provide regular and guided opportunities for children to be agentic through the process of enhancing the opportunities for them to make decisions about key features of their inquiry—in particular about *what* they inquire, *how* they go about it, what they record and share.
- Secure understanding of the inquiry process, e.g. shared understanding of progression in the Plan, Do and Review cycle.
- Consider assessment purposes (formative and summative) and focus (e.g. concepts and skills) in planning and implementation of the inquiry experience.
- Adapt the level of direction and guidance within science inquiry lessons so that not all parts of an inquiry need to be handled the same way, thereby creating a balance between creativity and assessment.

Flexibility when planning, and during the lesson, is likely to be necessary, in order to be able to respond to lines of inquiry that emerge as children increasingly make decisions for themselves. Teachers need to be attentive to the fact that they will make ongoing adjustments of children's learning within the lessons, an essential feature of formative assessment and responsive teaching. To include children in the decision making, releasing some control of the lesson, can initially be felt to be a big step for many teachers who feel the pressure of 'getting through' the curriculum, managing resources and behaviour. School senior leaders therefore need to offer supportive structures such as those described in the programmes above.

The tension between creativity, curriculum and assessment will inevitably always provide ongoing challenges, yet it is encouraging that by utilising support such as that provided by GSSfS and TAPS, it is possible to support creative primary science learning. Balancing opportunities for creativity, within a curriculum and assessment requirements, requires us to value both the benefits brought by guided inquiry, within which children have more agency and decision making opportunities, and by formative assessment, which is used to identify and feedback on progress. Creativity is not limited to 'arts-based' subjects (Mullet et al., 2016); by providing a range of opportunities for child-focused investigations and divergent thinking, we can make the most of the inherent creativity in primary science inquiry.

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