Are we doing enough?

Perspectives on disadvantage in the context of primary science learning

Lynne Bianchi inspires thinking about supporting 'disadvantaged' learners in primary science

In this article, I want to open up our thinking about a frequently used term – disadvantage – and to consider it in relation to our primary science classroom teaching and learning experiences. As a researcher in the sector for many years I have to admit that, although I have often discussed the broader issues in this area, it is only in the last 5 years or so that I have really had the opportunity to think more about this with specific regard to what we do as primary science teachers and educators. With the support of education charities such as the Comino Foundation and the SHINE Trust, our team has been exploring the concept of 'disadvantage'. A current study called Smarter Choices involves primary and secondary schools in Greater Manchester that are using collaborative reflective practice to focus on pupils' science learning experiences across the primary-to-secondary school transition, and to consider the issues of disadvantage within that.

Defining 'disadvantage'

Terminology in this area is interesting: what does 'being a disadvantaged learner' mean? How is it defined? For most of us, I think our default will be to say it is children who are eligible for pupil premium (Department for Education, 2021a), a grant that is intended to help disadvantaged pupils (in England) by improving their progress and the exam results they achieve. As such, we understand this to be those eligible for free school meals, looked-after or previously looked-after children, service family children and academically able pupils

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from disadvantaged backgrounds. Notably, pupils falling into the last category do not have specific funding allocated to them, although schools are encouraged to focus on these pupils as much as pupils with low results, as research shows that the most academically able pupils from disadvantaged backgrounds are most at risk of underperforming.

What are the issues?

Why is it important to understand this and grapple with the nuances that we see in our work with schools and children? Well, the issues here are well cited: there is evidence to show that children from disadvantaged backgrounds:

- **generally face extra challenges in reaching their potential at school;**
- **often do not perform as well as their peers.**

Now let's think about this as primary science practitioners, educators, consultants and advisers. Without criticism or blame, I look around and think about how often I see the issue of how we support 'disadvantaged' pupils in our primary classrooms being discussed, debated, innovated and reviewed. How often have I included it as a factor within my own research and programmes? Perhaps not as much as it should be, especially if we look at free school meal entitlement as an indicator of significance. We see the percentages of pupils eligible rising annually, now more than a fifth (20.8%) of primary pupils in England (Department for Education, 2021b). The most significant way I have approached it is through campaign activity, such as the Great Science Share for Schools (www.greatscienceshare.org), where we specifically target support for schools in areas of high socio-economic disadvantage. Yet I still think we can do more.

What can we do?

The *ASPIRES* report (Archer *et al.*, 2020) has been a leading light in this area, and Louise Archer continues to research the factors that influence pupils to be interested in and pursue a relevant career in science, technology, engineering and maths (STEM). By defining and describing the concept of 'science capital' she and her team allow us to understand better the patterns in science participation and engagement and how this impacts on learning opportunities, as explained here:

The most socio-economically disadvantaged students were two and a half times less likely to study Triple Science compared to the most advantaged. (Archer *et al*., 2020: 8)

My perspective is that as primary science teachers we should be thinking harder about this concept. I see it addressed at a whole-school level and many interventions designed and implemented to support pupils who face adverse challenges to their learning. However, after many opportunities to visit primary science classrooms, I don't think we are considering enough the issue of disadvantage in relation to how we design and conceive the experience pupils have in primary science.

The Smarter Choices project

I wanted to find out more. Through the Smarter Choices project we have had the opportunity to discuss this with Professor Sonia Blandford, a visiting professor of education at UCL Institute of Education, who is one of the UK's foremost experts on social mobility and author of the influential publication, *Born to fail?* (Blandford, 2017). During these conversations, she reiterated the significance of positive action:

If all children and young people facing economic disadvantage received high-quality early education the gap in achievement could be closed by between 20–50%. (Blandford, 2017: 47)

So, what's my message? What are we adding to the dialogue? We continue to ask questions, as by that process we stop ourselves rushing into surface-level, quick-fix solutions. We are working over 3 years with primary and secondary teachers, senior leaders and head teachers to turn the spotlight onto this complex issue, with specific focus on how learning experiences in primary science classrooms should or could be different when we design the curriculum to respond to tackling disadvantage.

By way of provoking thought, rattling cages and nudging us towards working together to consider inclusive pedagogies in our primary science classrooms, we are asking:

- **Are we doing enough to understand what issues our primary science learners face when learning primary science?**
- **Are we doing enough to understand our own beliefs, understandings, preconceptions and the potential stereotypes that we hold in relation to disadvantage and disadvantaged learners?**
- **Are we doing enough to consider how the interventions used in school to support disadvantaged learners in other subjects may apply in our primary science classrooms?**
- **Are we doing enough to work with disadvantaged pupils, and indeed their parents, to understand their experiences when learning primary science?**
- **Are we doing enough to identify teaching and learning approaches for primary science that are attuned to the needs of disadvantaged learners?**

Some observations from our current studies

Data

The gathering and use of data is entrenched within school accountability processes. Discussions with schools have shown that there is clear understanding of which pupils are eligible for pupil premium. There is data on other factors that impact pupils, such as special educational needs, English as a second language, attendance, and so on. There is data to describe pupil attainment in science (although over the past two summers, due to the pandemic, science teacher assessment data has not been required by the DfE). Yet, these data are not necessarily impacting on the way we design the science curriculum for either primary or secondary pupils.

Vocabulary

In Greater Manchester, we see large numbers of pupils whose first language is not English. Science is notoriously peppered with specific scientific terminology that can open or prevent access to learning. With more detailed understanding about tier 2 (high-frequency, sophisticated words not necessarily used at home but used in more academic contexts, e.g. analyse, combine, evidence, distinguish) and tier 3 (words that are not frequently used except in specific

content areas or domains, e.g. stamen, anther, gravity, solute) words, we are working with teachers to explore how more detailed planning for the teaching of specific scientific vocabulary could increase inclusivity and access to learning. Although this is being found to take time, teachers' initial reflections demonstrate a positive impact, not only on disadvantaged learners but on the whole class.

Aspiration

Pupils' interest in learning science and aspiration towards being a scientist emerges from a wide range of influences. By implication, the more limited the experiences, the less likely pupils may be to understand their opportunities and options within science. We are learning from colleagues in the sector, whose projects are focused on or around improving pupils' science capital, to explore how aspirations can be broadened and the impact of that on teaching approaches we promote. Inevitably, the involvement of parents and families is crucial, something that Blandford (2017) is keen to endorse.

So what?

This article aims to open up dialogue and thinking. In doing so we must appreciate the way we come to this and our own perceptions and thinking. What I personally have become more aware of are my own preconceptions, ideas and thoughts, which stem from my own upbringing. To this end, I finish with two quotes taken from *Born to fail?* (Blandford, 2017), and encourage you to reflect and read around this topic, as I think it is an area that we must come together on as a primary science community – and the sooner the better:

Given that the majority of teachers are middle class, an appropriate starting point might be to increase understanding of how working class, disadvantaged and SEND children learn, and refocusing teacher training and professional training on the majority of the population in schools, identifying what is needed to prepare children for work. (p.96)

Mutuality is not middle-class professional people dipping their toe into a life of disadvantage and then going away feeling they understand enough to call the shots. Mutuality is giving the other party a voice so they can engage – in a long-term way – on what happens next by working in partnership with others. (p.47)

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References

Archer, L., Moote, J., MacLeod, E., Francis, B. and DeWitt, J. (2020) *ASPIRES 2: Young people's science and career aspirations, age 10–19*. London: UCL Institute of Education.

Blandford, S. (2017) *Born to fail? Social mobility: a working class view*. Woodbridge, Suffolk: John Catt Educational.

Department for Education (2021a) *Pupil premium*. DfE policy paper. www.gov.uk/government/publications/pupil-premium/pupil-premium

Department for Education (2021b) Schools, pupils and their characteristics. https://explore-education-statistics.service.gov.uk/find-statistics/school-pupils-and-their-characteristics