Social Interactions

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In my first encounters with school science, I recall being under the distinct impression that my science textbooks were filled with unshakable empirically established truths that had been discovered many years ago by very clever old men. Anyone who thought so highly of himself or herself as to question the wisdoms held within these mighty tomes would undoubtedly be sent scuttling back into the pages with the verbal equivalent of a clip round the ear.

Despite my early impression of what the nature of science was, I was not put off. At school, I was increasingly drawn towards the subject which seemed to deal with trustworthy and established concepts. I found comfort in my dependable texts harbouring questions with their right and wrong answers. Then in 1986 along came the National Curriculum.

The new attainment targets in the first incarnation of the National Curriculum placed emphasis on the development of scientific ideas in moral, social and cultural contexts. This was partially inspired by the newly established theory of social constructivism (which holds that social interactions such as discussion are important for children’s learning). School science textbooks gradually started to project that scientific endeavour was uncertain, unconcluded and open to scrutiny. Revised editions began to include questions which began with phrases such as “How do you feel about…?”, “What do you think about….?” and “Do you agree with….?”

Despite the changes made to school textbooks, my school science experience during the 1980s remained fairly unshaken. Although my books had changed, my teachers had not, and they were clearly not comfortable seeking our opinions about science, and the pedagogical strategies that were needed to deliver the new science curriculum it seemed would take a while to filter through.

Let us now fast-forward 20 years or so to when I became a science teacher. How did things pan out? Well, throughout the 1990s, it transpired that the moral, social and cultural contexts for science became rather suffocated with the increased political emphasis on testing in UK schools. With constant time pressures in a crowded curriculum, anything that was difficult to write an exam question about might justifiably have been skipped over, and time-consuming ‘social interactions’ were frequently shelved in favour of less fashionable, but more time-efficient ‘chalk and talk’ methods of yore. My own attempts at getting teenagers to thoughtfully discuss socio-scientific issues and present coherent arguments generally fell flat with too many pitfalls to manage. Pupils frequently went off track, made things up, became repetitive and ended up talking themselves round in circles. Some pupils were too cool to join in, some too shy, some were too dominating and there was always the chance that some would get overexcited or upset. In my science department, the contextual focus became diluted over the years, and, while it was generally accepted that social interaction was a ‘good thing’, very few of us found we had the preparation time or the contact time necessary to indulge.

In 2008 and 2006, in the latest push for ‘scientific literacy’, major revisions were made to the Key Stage 3 and 4 programmes of study for 11–16-year-olds respectively, shifting the emphasis once more towards the societal and ethical implications of ‘science in the real world’. The compulsory ‘core’ science has been dramatically slimmed down (from 288 words to 78 for Key Stage 3 biology) to ‘increase flexibility for teachers and learners’. This blank canvas approach undeniably makes room for more social interactions in the classroom, and it is clear that they now feature more prominently than ever in schemes of work and teachers’ guidance materials from the exam boards. But will this space and flexibility be enough for the societal impacts of science and their associated social pedagogies to filter through to the classroom?

In 2007, the Biochemical Society asked teachers how they felt about the changes to the Key Stage 4 curriculum and where they would like more support. Although several felt that the slimmer core content would be more appropriate for the majority of
learners who would not go on to become scientists, concerns were raised over the change in teaching styles that are now expected. Debates, class discussion and dealing with opinions were all traditionally seen as the domain of the humanities and the skills required to tackle this side of science should not be underestimated. Most of our focus group was clear that they were out of their comfort zone with social interactions in science lessons.

Whether we agree with the direction that school science has taken or not, the reality is that some of our science teachers feel that their roles have changed considerably as a result. Here at the Biochemical Society, we believe firmly in supporting our school science teachers, which is why, over the last 2 years, our Education team has been active in setting up a range of online resources that teachers can use to help frame discussions on controversial issues (www.sciberbrain.org). We are also currently piloting our first CPD (Continuing Professional Development) programme for teachers and outreach personnel on running class discussions at the Science Learning Centre in London. If you would like more information about these and our other education projects, please visit www.biochemistry.org/education.

In the past, science has been viewed as a subject driven by content. The revised Key Stage 3 programme of study now provides a more appropriate balance between content and the scientific process or how science works. This is in line with the new Key Stage 4 programme of study and will provide greater flexibility for teachers and learners. Knowledge of conceptual and factual information is still important, but the range and content statements are less prescriptive and therefore provide more flexibility in their interpretation. They are as much a context for developing knowledge, skills and understanding of how science works as they are knowledge to be acquired in their own right.

As pupils develop their understanding of the key concepts and key processes, they will become more competent scientists, able to apply their knowledge, skills and understanding to new and unfamiliar contexts.

Qualifications and Curriculum Authority

When looked at holistically, this curriculum is really about forcing a government agenda which is set around tackling childhood obesity, binge drinking, casual drug taking and teenage pregnancy. My concern is about whether science is the right place for this sort of curriculum and whether science teachers are best qualified to deliver it? I don’t feel qualified to teach this sort of agenda any more than I am qualified to teach food technology.

I suspect that the failure of the DfES (Department for Education and Skills) to properly implement citizenship in schools and their dire failure to attract graduates into training to be food technology teachers has led to a stitch-up proposal which forces ‘related’ subjects to take the brunt of delivering a curriculum that is part social science and only part ‘core’ science.

One teacher’s opinion of the recent school science curriculum changes (TES connect discussion forum)