



Developing teachers as leaders of science in primary schools

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Context and aims of the research project

- Leading science in English primary schools:
 - In most primary schools science is taught and led by class teachers, many of whom express a lack of confidence about teaching and leading science
 - Many teachers report that science has been given less of a priority because it has been ‘squeezed out’ with literacy and numeracy pressures
 - The Primary Science Quality Mark (PSQM) has been recognised as one way that schools might address this issue (CBI, 2015)
- Aims of the research project:
 - To explore the impact of the Royal Society of Chemistry (RSC) bursary-funded PSQM on attitudes and aspirations of pupils and teachers with respect to science.
 - The focus of this paper is the impact of the scheme on the attitudes of teachers towards their role as a leader of science.

The Primary Science Quality Mark

- The aims of the PSQM award programme:
 - to raise the **profile of science** in primary schools
 - to provide schools with a **framework and professional support** for developing science leadership, teaching and learning
 - to **celebrate excellence** in primary science
 - to use **networks** to provide local support for science for schools
 - to assemble a rich **database** of current practice in primary science and make it accessible to the wider science education community.
- Schools can achieve bronze, silver or gold awards



Methodology

- Interpretive approach, listening to the participants, seeking to understand their experiences
- an email questionnaire
- semi-structured telephone interviews
- a focus group with science leaders
- a review of some of the data available on the PSQM portal



Science leaders' attitudes to teaching science

Many science leaders reported that they felt better equipped for their own teaching:

- Development of subject knowledge
- Development of science pedagogy
- A change in attitude: feeling more enjoyment and confidence when teaching in their own classrooms.

I now feel much clearer about what excellent science looks like

I have enjoyed teaching science more since working towards PSQM as I am thinking more about my teaching

Science leaders' attitudes to teaching science

I am more motivated to go away and look at things more deeply, learning on the way with the children... I am more confident and willing to take risks [with my teaching] which is exciting as before I was stuck in a rut.

I am far more critical of my own teaching, I want it to be as good as it can be. It has made me look further for materials, resources and ideas.

Science leaders' attitudes to leading primary science

Undertaking PSQM helped science leaders to understand their leadership role, which made them feel better equipped for leading others

before, I was ticking the boxes, doing observations, but I didn't really know what I was looking for.

I have developed professionally. I'm more confident, I'm more willing to lead staff meetings and drive things forward. I do learning walks, observe lessons, book scrutinies, which is something that I have never done before

Science leaders' attitudes to leading primary science

Many science leaders could see how their leadership was impacting on other staff and how the attitude of other teachers had changed:

- More consistency in the quality of teaching science across the school.
- Other teachers were being inspired to teach science in a more engaging way
- Staff working collectively to develop science

It is empowering because it feels like I'm not on my own. There are other people with you, working towards the same goal.

Science leaders' attitudes to leading primary science

Science leaders could see how developing a wider range of learning opportunities as part of their leadership role had enriched science teaching and learning beyond the classroom.

It was a pleasure to witness the wonder and excitement on the faces of Year 1 children when animals (including a chicken) arrived in their classroom

Seeing Year 3 children on the beach ... making the connection that the cliff behind them and the rocks under their feet were the same chalk that they had investigated in class was another great moment

Science leaders' attitudes to leading primary science

It's really nice to see the children who were not excited by science more engaged. It is the whole class now, not just individual children who had a flair for science.

it's motivating because you feel like it is actually starting to work. It has taken a good 6 months, but slowly, through children's comments, you start to feel like I am actually making a difference

Findings

- This research found evidence for changes in teachers' attitudes towards teaching and leading science due to engagement with the PSQM programme.
- Changes may have been due to a change in behaviour, prompting a change in attitude or a change in attitude that impacted the way that science leaders were carrying out their role
- To understand what this reveals about developing teachers as leaders of science, these activities were analysed in relation to Fairman and Mackenzie's (2012) conceptual model of the 'spheres of teacher leadership' which describes the ways that teachers demonstrate leadership

Spheres of teacher leadership

(Fairman and Mackenzie, 2012)

Science leaders were motivated to develop their own teaching.

They began to 'take risks' with their teaching and were more adventurous with their choice of resources

Spheres A and B



Spheres of teacher leadership

(Fairman and Mackenzie, 2012)

Science leaders felt more confident when leading science.

They worked across multiple classrooms, sharing ideas and learning with colleagues, with the aim of working collectively to develop science teaching across the school.

Spheres C-E



Spheres of teacher leadership

(Fairman and Mackenzie, 2012)

Science leaders were more inclined to attend to the climate and culture of the whole school.

They considered their role in the success of all students.

Spheres F and G.



Conclusions

- Science leaders' perspectives shifted from a narrow focus of improving a teacher's learning and practice within one classroom, to broader goals of improving teacher and student learning school-wide.
- This relates well to the recommendation by the Wellcome Trust (2015) that a Primary Science Leader should have a whole-school vision for science and be able to lead its development by providing continuing professional development to colleagues, monitoring progress and contributing to the strategic development of learning in school.
- There is also evidence to suggest that the development of an effective science leader impacted on the profile of science within the school and on the attitudes of pupils, echoing the view that

'...where science has a good profile within the school as a result of dedicated leadership, and where staff are expected to teach exciting, investigative science with access to high-quality science expertise, children are likely to enjoy learning the subject.' (Wellcome Trust, 2013, p. 3)

Recommendations

- Extend the study from the current schools who were enrolled for bronze and silver PSQM awards to those enrolled in gold to see whether the science leaders in these schools demonstrated leadership activities in all 9 spheres.
- Investigate the impact of doing the PSQM on pupil progress/attainment in schools

References

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