Senior Leader Perspectives on Managing Science Departments

ASSOCIATION FOR SCIENCE EDUCATION

Senior Leader Perspectives on Managing Science Departments

Headlines from an exploratory study

Summary

- Ten senior leaders were interviewed for their perspectives on managing science departments.
- Working Relationships between senior leaders and science departments varied from very positive to very difficult.
- Managing science departments was described as complex due to the size of the department, the structures within departments and the varying skills of science teachers. The interviews revealed several needs specific to science teachers and the barriers to meeting those needs.
- A list of strategies to improve or maintain relationships between senior leaders and science departments is presented.
- Three areas of interest to explore are spotlighted: benefits and drawbacks of having a science specialist line managing a science department, the impact of the isolation of some science departments within school and the extent to which science departments should be treated differently to other subjects.
- The report recommends that senior leaders new to managing science departments could be better supported in understanding the needs of science departments and science teachers.
- Further research questions are presented.

Context

Effective school management should focus on providing support, professional development, and resources to help all teachers thrive, regardless of their subject area. However, different subjects may have different needs. This study elicits and explores the views of senior leaders on the management and needs of science departments.

Methods

Ten, approximately 30-minute, one-to-one semi-structured interviews took place with secondary school senior leaders and science line managers (Appendix 1). Due to the sensitive nature of these candid conversations, pseudonyms have been used in this report.

Findings

The perspectives listed below are elicited from these ten interviews. From these, we have generated questions that could be further researched.

Question 1. How do senior leaders perceive their working relationship with their science departments (past and present)?

Descriptions of working relationships

Working relationships at their best

The science line managers who said they enjoyed managing the science department and had a good working relationship expressed these reasons:

- Positive working relationships with the Head of Science, particularly framed within 'trust', 'support' and being able to be 'honest'.
- Long-term working relationships established.
- Working closely with the Head of Science and the science team.

Working relationships at their worst

Early working relationships with the science department who they were new to managing were described as 'frosty', 'tricky', 'rocky' and 'temperamental and perhaps a little bit fractured'.

Where there were on-going negative perceptions, they were caused by:

- A history of poor relationships with line managers of the science department.
- Science teacher or department reactions to change.
- Perceptions of individual teachers being difficult or unprofessional to work with.

The senior leaders said that science departments are comparatively more complex to manage than other subjects. Why?

Size of the department	Structure of the department	Skills distribution
Often the largest department, so more staff needed, including specialist technicians. All pupils do science at Key Stage 3 and 4. Often many doing A-level and vocational courses when available. A significant proportion of the timetable is allocated to science classes. Practical work has to take place in functioning science teaching laboratories.	Line manager often manages a Head of Science who manages others with significant responsibility (e.g. Head of Biology, Chemistry, Physics). Science technicians are essential support staff for an effective science department. Complexity of examinations e.g. Triple and/or Combined, Higher, Foundational GCSEs. Sometimes vocational and A-levels.	Science teachers usually have a specialism of biology, chemistry or physics. Different science teachers will have different levels of confidence and competence at teaching their non-specialist science subjects. Practical work is a statutory requirement in science subjects. Practical work requires understanding of and adherence to health and safety legislation

Question 2. To what extent do science departments have specific needs when managing them compared with other departments?

All interviewees had insights into the specific issues that face science departments and teachers. There are likely to be other issues that were not raised in these interviews.

Summary of some specific needs of science departments:

Needs	Barriers to meeting these needs
Specialist laboratory space to teach in	Insufficient laboratories for number of staff/pupils Moving between teaching spaces Complications of split-site schools Limitations of old or listed buildings
Laboratory equipment and resources to teach statutory and non-statutory practical activities	Non-specialist teachers teaching practicals – require technical support and training Costs of practical equipment and consumables and maintenance Classes too large to safely do whole class practicals
Technical support for practical preparation, equipment ordering and maintenance and health and safety	Recruitment and retention of science technicians Insufficient pay and conditions Technicians being used for administration
Opportunity for teachers to teach predominantly their science specialism	Lack of specialist science teachers recruited High turn-over of science staff Discontinuity of school and department leadership staff
Informal and formal support or training when teaching out of specialism	Time and cost Lack of experts in-house
Training to keep up with curriculum change (e.g. how energy is now taught, Welsh curriculum change)	Time required to make changes at a larger scale. Lack of experienced specialist science teachers recruited to support change

Question 3. What can be done to maintain or improve working relationships between senior leadership and science departments?

When interviewing more experienced senior leaders, they were asked what advice they would give a new, non-specialist senior leader who was taking on managing a science department. These insights have been used along with other data obtained from the interview conversations.

The main categories that emerged were:

- Line managers need good management skills: listening and effective communication
- Experienced line managers may be in a better position to take on more 'troubled' science department
- Understand the science subject(s)
- Understand the science department and its place in a school system
- Meet with and understand the role of science technicians
- Understand the needs of a science department and individual science teachers
- Engage with the curriculum and the qualifications being taught
- Understand the controllable and uncontrollable issues of science teacher recruitment and retention. Work with the Head of Science to be strategic if possible
- Advocate for the department in senior leader meetings (and beyond)
- Promote science teacher development.

Line managers may need support to be able to do this.

Spotlight issue A: Benefits and drawbacks of a science specialist being a science line manager

The question arose frequently of whether being a trained science teacher themselves makes line managing a science department easier than being a teacher trained from another subject.

The benefits suggested included:

- A science teacher will 'just get it' – understands the needs of science departments, teachers and technicians
- Fewer things need explaining at the start of the line management relationship
- During senior leader meetings, a science specialist teacher will be more likely to advocate for the science department, before the science team are even aware of potential problems.

The drawbacks included:

- Missed opportunities to have perspectives and views from beyond science

There was also the view that it isn't the subject specialism that is important, it's just a line manager with good management skills that was needed to have a successful relationship.

Issue spotlight B: The isolation of science departments

An issue that was raised was the geographical isolation of science departments in a school or college and the lack of mixing of science staff with the rest of the school during breaks and lunchtimes.

The reasons for science teachers not mixing in the staff room with other staff include:

- The science department being far away from the staff room
- Having a prep-room to meet at breaktimes or a science area to have drinks and food at breaktimes
- Needing to set up equipment for practical work in breaktimes

This isolation could lead to:

- Lack of understanding of issues facing other teachers and other subjects
- A sense of isolation or separation from the 'school' as a whole
- Science teachers becoming a 'clique'.

Issue spotlight C: Should senior leaders treat science departments and teachers differently to other subject departments and teachers?

Responses to this question included:

- All subjects need to be treated differently according to their needs
- Effective management and leadership are about adapting to the needs of individuals and departments.
- Recognising that physics and chemistry have teacher shortages and the fairness of differential pay

Recommendations

1. **Head teachers, senior leaders and school governors** should seek to engage with the issues raised in this report and, where needed, make efforts to support science departments and science teachers meet their needs to be as effective as possible.
2. Inexperienced line managers or new line managers to managing science departments would benefit from some guidance on the needs of science departments. This guidance could be produced by the **Association for Science Education** based on this research and other sources.
3. Further research into developing positive working relationships with science departments could help improve working relationships between science departments and their senior leadership team and, we infer, could improve the retention of science teachers.
4. Further understanding the perceptions of science departments and science teachers by senior leaders, especially those from other subjects, could help develop and maintain positive working relationships between senior leaders and science departments. This could consider stereotypes of scientists and unconscious bias. This could be done through more specific and in depth qualitative and quantitative research e.g. working with *Teacher Tapp*.

Questions arising for further research

- Is managing a science department more complex than most other secondary subjects?
    - If so, is it preferable that experienced senior leaders manage science departments?

- Are science specialist senior leaders more effective at line managing science departments?

- What knowledge and skills do line managers of science departments need to be effective?

- Are science teachers more difficult to manage than other subject teachers?
    - Does unconscious bias of stereotypes of science teachers impact how they are managed?

- Which, if any, of these factors that impede addressing the needs of science departments or teachers are most significant in influencing recruitment and retention of science teachers?
- Is there a compounding effect of one or more of the impeding factors having a negative effect on science departments?
- Can we compare the isolated (by location within school) science departments and non-isolated science departments?

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Appendix 1

Table 1. Information about the senior leaders and their schools who were interviewed.

Pseudonym	Role	Gender	Line manager	Subject specialism	Type of School	Location of school	Nation	NOR	No. Sci teachers	No. Technicians
Azalea	Assistant Headteacher	M	Science	PE	State	Leighton Buzzard	England	1300	15	2
Buddleia	Assistant Headteacher	M	Science	Science	State	West Sussex	England	1200	13	5
Camelia	Assistant Headteacher	M	Science	Science	Academy	London	England	1100	12	1
Darwinia	Principal	F	All	ICT	Academy	Staffordshire	England	2400	17	nd
Erica	Assistant Headteacher	F	Science	Science	State	Hampshire	England	600	5	1
Forsythia	Assistant Headteacher	F	Biology	Maths	Independent	nd	Wales	560	10	4
Gorse	Assistant Headteacher	M	Science	Biology	Independent	London	England	450	8	2
Hebe	Assistant Headteacher	F	Science	Science	State	East Sussex	England	1000	11	1.5
Ilex	Ex middle manager	M	Science	Chemistry	Further Education	Midlands	England	nd	nd	nd
Jasmine	Assistant Vice Principal	M	Chemistry and Physics	Chemistry	Academy	Birmingham	England	1200	12	3

Table notes:
[1] **F** or **M** indicates female or male respectively
[2] Some participants line managed other subject departments in addition to science subjects
[3] **nd**: indicates no data was collected
[4] NOR: Number on Roll – approximate number of students enrolled in the school or college