

Evaluation of education policy development at the RSC – Comments from the Committee for schools and Colleges

The Committee for Schools and Colleges reviewed the report of how a small sample of people who work in jobs that interface in some way with RSC education policy for schools and colleges feel about the RSC policy positions and the ways RSC develops policy. The full report, including a summary is attached.

The Committee would like EQB to note the following:

- the professionals interviewed have developed perceptions of RSC education policy that may not be fully congruent with the EQB policy (attached). Their perceptions are probably based on the strategies that the RSC has adopted in fulfilling its education function over the last few years;
- these perceptions are generally positive and there seems to have been a strengthening of RSC's position in chemistry education in recent years;
- many of the suggestions for policy development are in fact strategic developments that focus on how to achieve policies. It is heartening to know that many of these suggestions are already in hand.

The Committee for Schools and Colleges would like to request that in the light of this review it is invited to reconsider the RSC policy statements for schools and colleges and suggest to EQB how they might be further developed. For example the Committee for Schools and Colleges would like to include a policy point on support for Initial Teacher Education in chemistry.

Evaluation of education policy development at the RSC

Report of the analysis

Mike Coles, August 2003

In summary

The RSC is evaluating its functions as part of a strategic review of the Society. The education function is being evaluated in two parts, (i) the development of policy and its impact and (ii) publications and training. The Committee for Schools and Colleges has steered the evaluation programme. This report is about the first part of the evaluation programme – the evaluation of policy development and its impact.

Nineteen stakeholders in science education in the UK and wider afield were interviewed and their views elicited on the way RSC makes policy, the coherence of its policy positions and the impact the RSC has on science education. This evaluation is not therefore based on statistical methods or on representative sampling of respondents.

The policymaking process and to some extent the impact of RSC policy is not clearly understood by stakeholders. Many respondents did not seem to be aware of the key policy objectives of the RSC developed by the Education and Qualifications Board. Rather they relayed their perceptions of RSC policy that was often confused with strategy. The RSC could reconsider how to engage member's attention with regard to the policymaking process and policy positions including laying stress on the coherence of its policies.

The RSC maintains a strong and central position in national science education developments. The role of the RSC is highly regarded as professional and influential by those managing national programmes and those at the chalk face. People from across the spectrum of educational stakeholders hold high expectations of the RSC.

The RSC is perceived to compare favourably with other agencies influencing education policy in the UK. It is considered effective across all areas of education (e.g. influencing national school curricula, higher education) except initial teacher education where it is thought that more could be done that could benefit chemistry education.

Education policy at the RSC is considered sound. It is based on good consultation and comes across as progressive. There is a view that the longer term the thinking is that underpins education policy the better it is for chemistry. However teacher members were concerned that policy had to interface with current practice and allowances must be made for the current workload of teachers and the constraints they work against.

People suggested many areas for future policy development. Amongst these one stands out and that concerns developing policy on the role of chemistry and science education for 14 – 19 year olds.

Unfortunately the number of company-based industrial liaison officers in the UK is falling. The RSC could consider working with chemical companies to maintain the flow of useful industry-focused schools materials.

Many other suggestions for future policy activity were made, these are also listed in this report. The wide range of suggested policy directions and the actions which could follow from this report suggest that the size of the RSC education department may need to be enlarged if it is to continue to be innovative and continue to have the capacity to respond effectively to initiatives.

Views were expressed about improving internal communications at the RSC (for example between the media team and education) and to modernise boards and committees to strengthen representation from progressive school and college education interests. This relates to the view of many interviewees that the impact of chemistry on young people is not as strong as it could be and is a problem which may worsen. Interviewees thought that a fresh view of appropriate pedagogy for young people is needed.

The work on the RSC's position with regard to the national curriculum for science in England and the form of chemistry to be included in the curriculum for 14 – 16 year olds was singled out as an important recent activity where the RSC had a notable positive impact on decisions. Other notable policy initiatives are listed in this report.

Taken as a whole this evaluation shows the RSC as playing a strong and central role in science education generally and chemistry education in particular. Evidence suggests the RSC has extended its influence in recent years and its policy positions are respected by national agencies. With this strong position comes higher expectations of the education department and consequently this evaluation identifies several key areas for future policy work.

Overview

The RSC Education Department works to enhance chemical sciences education in schools and colleges in two main ways. The first is by representing the interests of chemical sciences education through establishing the RSC as the key authority in the UK and internationally. The second is by delivering to teachers of chemical science and their students high quality products in the form of student materials, teaching materials, careers advice and continuing professional development. The second function is being evaluated by a team of evaluators from the Open University the review of the first function is reported in this document.

The Committee for Schools and Colleges has had oversight of this work; it is intended that reports of all evaluation activity will feed in to the RSC's examination of its future functions.

The research supporting the evaluation involved using a semi-structured schedule (see annex 1) for face-to-face interviews¹ with people who are regarded as key stakeholders in relation to RSC policy or people that are in a good position to judge the effectiveness of that policy. Nineteen people were interviewed, five of these could be regarded as internal to the RSC.

The interview process was designed to elicit responses about impact of the RSC. Four main areas of questioning were developed:

1. How well is the education policy-making mechanism working?
2. Is the RSC's presence in science education developing?
3. How effective is the RSC in shaping chemical science education?
4. Are there opportunities for the RSC to improve its impact on chemical science education?

The interview data was supplemented by recent published materials that reference the work of the RSC in education. Policy papers and the minutes of key boards and committees were reviewed.

Interviewees

This is a small-scale review of policy based on 19 interviews with key people who work in areas that interfaces in some way with RSC policy. It is not a statistical survey, nor have the people selected for interview been sampled for anything other than their job function - usually they were the only interviewee carrying out that function, for example, the education officer function within a parallel science professional body. The interviewee sample was designed to cover people in the RSC itself, government and its agencies, political lobby groups, education (secondary, further and higher), examination boards, media, industry, professional bodies and charitable bodies. The regions of the UK were sampled. Nine of the nineteen interviewees had, at some time, worked in chemistry education. Almost all interviewees had a national role in their current job, some had international responsibilities. The level of knowledge of the RSC's policy development process varied enormously. Some knew it intimately, others wanted to develop further their

¹ Interviews were carried out between April and June by Norman Hooper, a chemistry teacher and ex chairman of the Committee for Schools and Colleges and Mike Coles, a professional researcher and the current chairman of the committee.

understanding of what policy itself might be and how it would appear in a chemistry education context. All interviewees had contact with the RSC and its education function in one way or another. Most people had formal links with the RSC, either as being an employee or through regular professional meetings or through RSC commissioned work. Some people had witnessed RSC policy being expressed or received communications, such as journals, from the RSC about its policy. Some people ran projects which the RSC supported. Five people, other than staff, had direct experience of RSC INSET events.

Knowing policy when you see it

People often confuse policy (direction, intent, mission) with strategy (plan of action, how something will be done), whilst sometimes product (e. g. the Chemistry Olympiad) is believed to represent policy. The interviewers were aware that the interviews were not based on interviewee's knowledge or understanding of the RSC policy developed by Education and Qualifications Board on behalf of the RSC. People were giving their perception of RSC policy and this report should be understood to reporting those perceptions.

About half of the people interviewed had a clear grasp of how policy develops and how much it influences chemistry education, the other half seemed to have difficulty in expressing a view about policy - the interviewers suspect that they hadn't thought about it much prior to the interview. As for the process of developing policy most people thought it was to do with committees, there was some confusion over the source of policy - some people believing it to be derived from the membership others thinking that RSC staff developed the policy overview. During interviews people seemed to become more comfortable about discussing policy formation and its impact. This apparent lack of awareness in some interviewees became less of a problem when specific areas of policy or educational issues were raised and discussed. There is perhaps an issue for the RSC to consider here – how to engage members attention with regard to the policy making process and policy positions.

Expectations

People were asked to say what they thought different stakeholder groups expected of the RSC in terms of policy². There were no significant differences in views between internal and external interviewees.

Teachers in schools were thought to expect the RSC to lobby government for better resources and appreciation of school chemistry, to lead the way in development and to represent their views when national developments are taking place. The RSC is the first port of call for chemistry information for many chemistry teachers, it is the key agency which keeps them up-to-date and coordinates the profession. Teachers also see the RSC as the body which was able to bridge the gap between chemistry as practised in schools and that which happens in industry.

College teachers were thought to expect much the same things as school teachers although it was considered that a significant group of FE teachers expected nothing of the RSC. A small group of people, with a particular interest in FE said that RSC could

² Note that expectations in terms of resources are evaluated in another report.

do more to monitor the specific issues in FE such as the more diverse student body studying chemistry and the lack of job security for chemistry teachers.

Higher education tutors were thought to see the RSC as the source of authoritative opinion on chemistry and a major source of advice. They see the RSC as representing the discipline of chemistry rigorously. They were also thought to see the RSC as the chief ‘populariser’ of school chemistry – a crucial role if enrolments in chemistry degree courses are to rise. Some interviewees saw university departments as portraying too narrow a view of chemistry against which the RSC was battling. There was a view that RSC local sections were dominated by university tutors and that this could be seen to be ‘the tail wagging the dog’ in terms of chemistry education.

Industrialists working for science education were considered to be having a hard time recently with diminishing numbers and broader roles for those in remaining in post. They were considered to expect tight liaison with the RSC including being the early recipients of emerging policy issues. Several interviewees suggested that the Education Department of the RSC could fill a growing void here.

Those in other professional bodies were thought to expect close liaison with the RSC. One interviewee thought the RSC was developing a central role, bridging biology and physics. Partnership working was an expectation suggested by some people.

The DfES and the Qualifications and Curriculum Authority were thought to respect the authoritative position of the RSC and saw RSC policy as a key element in any consultation on education matters. Several people thought that the RSC has recently established a position of trust with DfES and QCA.

The Teacher Training Agency was considered to be a problem area for this evaluation, most interviewees were unable to express an opinion and others pointing out low expectations of the TTA and by the TTA of the RSC.

Charitable bodies with an interest in chemistry education were considered to have a symbiotic relationship with the RSC, the chemistry expertise of the RSC coupling with the diverse educational perspectives of the various charitable bodies. The RSC was seen as a sounding board on chemistry education issues and a means of access to professional chemists.

Parliamentary people were thought to have high expectations of the RSC that have developed from good experience of concise, professional and well tempered advice.

Members of the RSC generally would expect the RSC to keep them up-to-date through publishing articles on developments in science education. They would also expect the RSC to be the defender of the discipline.

Views on RSC education policy

Interviewees views on educational policy at the RSC were sought through four main probes, they were asked:

- a general question about rating, in their own terms, the effectiveness of RSC policy;

- to judge the impact of the RSC's policy in relation to other science-based educational bodies;
- to highlight the key policy initiative of the last 5 years; and
- to signal whether the RSC had increased or decreased its presence in education in recent years.

Analysis of responses to these probes follows.

General appropriateness and effectiveness

People rated RSC policy positively. The key message was that policy was educationally sound and well informed at the level of detail. People considered the RSC a champion for chemistry education in the UK. There was a theme in the evidence related to pragmatism in policy positions, some thought that policy should be pragmatic and related strongly to practice in educational institutions, others commented that this tends to slow development of policy down and a longer term, more strategic approach was in the best interests of chemistry education. This corresponds to the views of a set of people that were content with the visionary nature of policy and, acknowledging that longer term thinking is difficult, wanted even more longer term policy from the RSC. One person commented that RSC education seemed at its most visionary when its position was under attack. Some people considered the RSC to be progressive and supportive of innovation but several of these wanted a faster pace to innovative work even if this put pressure on the teaching membership. Teachers interviewed urged the RSC to continue to take note of what teachers could cope with in their work.

There were also generally positive views on the coherence of policies when these were taken together, the only caveat to this was that sometimes it took time to see the coherence and there should be more time taken by staff to explain the congruence of policy positions.

There were some negative views. One person highlighted the ongoing problem the RSC has with its policy on creating a positive image for chemistry in schools, another said that whatever the nature of the education policy it had to impact in classrooms. Another interviewee said there is a sense in which RSC favours the favoured, referring to its strong relationship to schools where chemistry is, relatively speaking, healthy and thriving.

External interviewees thought that there should be greater coordination in the policies of all organisations who support science in schools and colleges; one said the individual bodies 'mean well and try hard but education is too small a pool for all these bodies'. Another respondent said that a coordinated policy on falling numbers of chemistry undergraduates was the big problem requiring coordinated policy.

All internal people interviewed were less forthcoming in rating policy, there was a general sense that it was effective, particularly in schools, and that it may be less so in higher education. There were some critical comments about how policy is communicated to others.

Impact of RSC education policy

Interviewees were asked if the RSC was weaker or stronger than other key science education bodies when it came to the impact of their respective education policies. This was a difficult area to probe, for example were we asking about the impact on chemistry or the impact on science education? Were we asking about impact in schools or on chemistry learning wherever it happened? Another problem was that for many people the impact of the RSC is strongest through its publications and these are not part of this evaluation. Notwithstanding all of these difficulties the question was asked and some general messages have emerged. Internal RSC people were not asked this question.

Overall the ASE was considered to have a marginally stronger impact than the RSC, this is probably attributable to its wider remit in science education and broader membership. The IOP was considered to be just about on a par with the RSC in terms of impact of policy; all other professional bodies were considered to be weaker. Opinion about the impact of policies from charitable bodies relative to those of the RSC was generally evenly split - people mentioned Nuffield and Salters as being strong organisations, However they did not identify the policies of these charitable organisations. Publishers and the science education media were also considered to have a marginally stronger impact than RSC policy. The clearest evidence in this section is that awarding bodies are considered to have a much stronger impact on science/chemistry education, often this was regretted. In summary the RSC seems to be holding its own with bodies with a much wider remit for science education. As a result of the difficulties in assessing relative impact of policies from different bodies the data were re examined in two ways. Firstly the judgements of those interviewees who had a broader professional interest in education than chemistry were considered. For this set of people the position of the RSC is much stronger than described above. It seems that non chemists see the RSC in a more positive light than chemists. Perhaps those who are chemists take for granted the RSC influence and possibly seek an even stronger influence from the RSC. The second approach was to look at the data to see whether people thought that the RSC's position in terms of education policy was improving, declining or remaining about the same. A five year timescale was selected. No interviewees thought that the RSC's presence had decreased, they were evenly split amongst those who thought that presence was about the same and those that thought it had increased. Reasons were often given for the latter, for example the opening up of government agencies to professional body influence (the RSC had capitalised on this), hard work from RSC staff and finally the wealth of published materials provided for teachers and careers advisers. In overview this is a positive position – the RSC education function is influential, possibly more than is obvious and seems to be increasing its presence and influence.

Areas of impact

RSC policy could impact on different parts of the education system in different ways. Most interviewees responded to questions about impact on different parts of the education system, including internal people. Interviewees were asked to rate impact in each area of education on a five point scale (1= strong, 5 = weak). The average response for the impact on policy on the National Curriculum for schools was 2.2 which signals a general view of positive impact, there was little variation in judgement amongst the different stakeholders. For post 16 education there was a more positive rating of 2.1 and this was also derived across a remarkably consistent range

of scores for different stakeholders. When asked about impact on schools and colleges the ratings were 2.5 and 2.6 respectively, again positive scores although there was more variation in scores amongst interviewees. The rating for influence on HE was the most positive at 1.9 but this figure was derived from a highly polarised set of scores. Impact on INSET for teachers was rated at 2.1 which rounded off the set of positive responses. The only negative rating was reserved for initial education of teachers which was scored at 3.7. These figures signal that RSC education policy is regarded as influential on the major areas of chemistry education, the figure for teacher education suggests further investigation might be useful.

Most interviewees wanted the RSC to extend its influence further.

Exemplary policy initiatives

Interviewees were asked to identify the most important education policy that the RSC had produced in the last few years. One area stands out in the responses - the redesign of science in Key Stage 4 and the RSC's stance in terms of the amount, nature and distribution of science (and chemistry) in the national curriculum. Policy for post 14 education generally was identified as important by several interviewees.

The work of the recent teacher fellows (in primary science, building on misconceptions, issue based chemistry and use of information technology in chemistry contexts) was considered to have a policy impact. Green Chemistry was singled out as a key initiative.

The poster campaign 'not all chemists wear white coats' was viewed as a key initiative in policy.

Some people thought that the RSC had an effective policy line in broadening the understanding of chemistry in work situations. Others thought that support for non chemists teaching chemistry in schools was an important policy decision.

Several people pointed out that meeting the needs of teachers by improving the production and distribution of quality resources to schools was a key policy decision.

Extending its influence

How could the RSC extend its influence in the future? This was a key area of questioning and interviewees had many ideas. Some of these ideas are already being developed through RSC activities³. Nevertheless all the suggestions are reported so that a flavour of where people see the greatest need for policy emerges.

The most common suggestion was for the RSC to apply itself to developing the 14 – 19 area of science education*. This was clearly stimulated by recent government papers on this field. People saw the RSC as being able to identify the right chemistry to be included in specialist programmes and those for students with broader interests. A key word used by interviewees was 'relevance'; they believed that the RSC has the potential to make chemistry relevant to young minds. People believed that the RSC should promote more flexible approaches to learning chemistry and 'change the face

³ Areas where work is currently underway is marked with an * [this data entered by the Education Department]

of chemistry' for many 14 – 19 year olds. In particular they thought the RSC was in a position to arrest the 'top down' influence of the universities on school chemistry education and allow it to develop in a different direction. One interviewee said the RSC must 'overcome the influence of fuddy-duddy members'.

The next most popular response was in terms of bringing a European flavour to chemistry in the UK – it is not clear from the interviews how this might be done.

Roughly on a par with this suggestion in terms of popularity was the idea that the RSC should lobby more for chemistry education and in particular that it should link with other professional bodies to do this for science*. There was a statement 'in a noisy world the message must come across clearly' which summarises these views.

There were two areas where it was acknowledged that there is existing activity but that it might be strengthened. The first was in terms of supporting non chemistry qualified people teaching chemistry in schools* and the second was in terms of making science exciting to young people. People said that the RSC should try to answer the question 'so what' which often comes from students when chemistry is described or demonstrated. One way to do this might be reduce addressing the 'wants' of teachers such as 'help me with KS4' and to switch to wider needs such as 'inspire my class with me'. It was suggested that the RSC could try to get over the idea that chemists are not on the 'freaky fringe'. The latter point is additional to the relevance issue described above with respect to 14 – 19 education and focuses specifically on drawing out good ideas from teachers and disseminating them.

There were several points made about future involvement in teacher education. People thought that future chemistry teachers were a key group worthy of future attention, Making an impact on PGCE courses* and establishing productive links with the TTA and the GTC* were suggestions from three interviewees. Another interviewee wanted the RSC to aim to extend the knowledge of chemistry amongst teachers at different levels through INSET.

All other suggestions for future policy were made by just one respondent and these are listed below.

- Become influential in the new national network of science centres*.
- Work more through regional arms of the RSC*.
- Become more broadly-based in terms of science - good approaches to chemistry are good approaches to science education*.
- Influence American Chemical Society territory with vision from the UK*.
- Broaden the membership of RSC committees to involve a wider range of those with an interest in science education.
- Sell the RSC more to the education world, especially in the regions, and communicate the notion that the RSC is about promoting chemistry* not just meeting the needs of members of the RSC.
- Use the media more – identify simple chemistry-linked stories* and offer immediate support for teachers (including non chemists) on the web.
- Use Chemistry in Britain to carry more educational material and explain policy.
- Focus more on chemistry-related health and safety in schools*.
- Work on the biochemistry angle of biotechnology.

- Set up a forum for Assessment in chemistry.
- Provide guidance on chemistry and citizenship.
- Focus more on the skills side of chemistry in publications*.
- Ride on other national initiatives eg the KS3 strategy*.

On reflection it may have proven useful to ask a question about areas in which the RSC had already fulfilled a need or areas where RSC intervention was now less important. Unfortunately these questions were not asked.

Endpoint

This evaluation of RSC education policy was a small-scale survey which dealt with an area which many people find difficult to conceptualise and for which there are diverse understandings. However the results can be relied upon to serve as indicators of how effective the RSC policy has been, its current standing and where it could usefully turn in the future.

The points raised here have been considered by the Committee for Schools and Colleges and a summary of the views of this committee as to future policy directions are summarised in an accompanying document.

Annex 1

External interviewees

1. Current role details
 - time in post
 - what experience have they of educational work
 - job functions, internal, regional, national, international

Obtain some idea of depth of knowledge of:

- (a) educational policy making processes
- (b) what the RSC does

2. How do you interface with the RSC?
Probes following answer could include:
 - Meetings (inc. local sections work and informal interface)
 - projects
 - policy
 - publications
 - INSET

3. Where do you learn of RSC educational policy?

4. How do you rate educational policy emanating from the RSC?

Probes following answer could include:

- Makes good sense for chemistry?
- Makes good sense more generally?
- Is coherent with other RSC policies?
- Is long term and visionary?
- Is generally progressive and supporting reform?

Specific examples needed here.

5. What do people expect from the RSC in terms of educational policy development? Ask for these sub groups
 - Schoolteachers
 - College teachers
 - University lecturers
 - Industrial education officers
 - Other professional bodies (inc Science Council)
 - DfES/QCA
 - TTA
 - Charitable project teams
 - Parliamentary people
 - Members

Make a summary of the above.

6. Ascertain awareness of policy-making process in RSC. Where is it weak/strong?
7. Rate the RSC as an influence on chemistry/science education
Ranking exercise
 - (a) against other named agencies (ASE, IOP, IOB, GTC, RS, Nuffield, Salters, Publishers, BBC/ITV, Exam boards, others) use RSC
>, =, < or dk
 - (b) on different parts of the system, Nat. Cur. Post 16, schools, colleges, ITT, INSET for Teachers, HE. 5-point scale like: strong, positive, average, negative, weak.
8. Over the last five years has the RSC increased its presence on the forms chemistry/science education? (Yes, no, don't know)
9. Where is RSC seen at its most effective and why?
[From, for example the perspective of government, teachers, other professional bodies, etc]
10. Identify the single most important RSC policy initiative in the last five years
11. Where is the RSC well placed to extend its influence? Try to reserve time for this question.

A general summary of points of interest in the interview.

Internal interviewees

1. Current role details
 - time in post
 - what experience have they of educational work
 - job functions, internal, regional, national, international
2. How do you rate educational policy emanating from the RSC?
How would you describe good policy? Specific examples needed here.
3. What do people expect from the RSC in terms of educational policy development? Ask for these sub groups
 - Schoolteachers
 - College teachers
 - University lecturers
 - Industrial education officers
 - Other professional bodies (inc Science Council)
 - DfES/QCA
 - TTA
 - Charitable project teams
 - Parliamentary people
 - Members

Make a summary of the above. Where in educational policy terms is RSC seen at its most effective and why?

4. How does the (policy-making) process in the RSC facilitate good policy? Where is the process strong? What are barriers to good process and good policy?
5. Rate the RSC as an influence on different parts of the system, Nat. Cur. Post 16, schools, colleges, ITT, INSET for Teachers, HE. 5-point scale like: strong, positive, Average, negative, weak.
6. Over the last five years has the RSC increased its presence on the forms chemistry/science education? Yes, no, don't know?
7. Identify the single most important RSC policy initiative in the last 5 years.
8. Where is the RSC well placed to extend its influence? Try to reserve time for this question.

A general summary of points of interest in the interview.