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# Searching For Meaning

## Science and Religious Education teachers working together

EXTERNAL EVALUATION FINAL REPORT - JANUARY 2013

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# Key findings from the project

**This section summaries the findings from each of the main data collection strands.**

## **BASELINE SURVEY**

Both science and RME teachers were willing to engage in collaborative working despite a perceived increase in their workloads and a recognition that a number of issues (including timetabling) would have to be addressed.

There was substantial scope for such collaboration, none of our respondents had been involved in any joint RME/science training or CPD and there was little evidence of pre-existing formal collaboration between the two subject areas. Moreover, both science and RME teachers agreed that a range of support activities should be prioritised including 'joint CPD' and 'planned collaboration'.

While the overwhelming picture was positive there were a small number of, predominately science, teachers who indicated that joint working between science and RME was difficult to envisage given their different philosophical underpinnings. However, support for this viewpoint should not be overestimated given the enthusiasm among both groups of teachers for greater cooperation and collaboration with each other.

## **CPD AND INTERMEDIATE SURVEY**

Teachers involved in the Searching for Meaning CPD sessions were overwhelmingly positive about the experience, the project leader's input and the resources/materials they observed.

The majority of participants' expectations of the session were met in full and many had obviously followed up the CPD with plans for developments in their own schools. Indeed a number of teachers indicated that they had already embarked on some collaborative working with colleagues.

## **FINAL SURVEY AND CASE STUDIES**

The final survey had a much reduced response rate compared to the intermediate survey. However, those teachers who did respond provided a relatively full picture of what they had, or had not, managed to achieve in the period following the SSERC CPD.

The SSERC CPD had had an impact on teaching, practice and professional relationships among responding science and RME teachers and a majority of them indicated having become involved in joint science/RME work. Moreover, a majority also noted; having a wider network of colleagues, introducing the SSERC CPD materials to their teaching, being more able to implement *CfE* and taking on a significant role in science/RME collaboration at departmental and/or school level. A majority of the teachers also indicated that their enthusiasm for teaching had increased.

There was also some evidence to suggest that both science and RME teachers felt more confident in engaging with pupils in discussing ethical and moral issues following the CPD. Eight of the teachers provided vignettes of how the work had developed in their school. In a number of cases these vignettes indicated that time, workload and timetabling issues were the key barriers to developing joint science/RME work.

The case study schools give a strong indication of the benefits to staff and pupils which can follow from joint science RME work. However, they also indicate that such developments require enthusiasm and commitment on the part of staff and firm support from management to help overcome some of the difficulties encountered.

**This is the final evaluation report from the *Searching for Meaning (SfM)* project. The project began in January 2011 and was completed in January 2012.**

The report is divided into five sections:

- Section 1 - Introduction to the project
- Section 2 - Aims and objectives of project
- Section 3 - Methodology
- Section 4 - Main findings
- Section 5 - Discussion and conclusion

This was an Action Research project, funded by the Esmée Fairbairn Foundation, which set out to explore how schools might better draw on science, philosophy and religious studies to help promote the values inherent in the different disciplines. Action Research involves the use of an integral process of research and evaluation to inform project decisions and ensure that developments and practice are evidence based.

The project was based in Scotland and worked primarily with Scottish school teachers, although, efforts were made to widen the project experience and develop work through the National Science Learning Centre North East (SLCNE).

Specifically the project addressed itself to the following two questions:

- Can science and RME teachers work together on themes in a way which will enhance pupils' understanding of science/religion issues?
- What are the resource and CPD needs of both groups and can we establish an effective model for interdisciplinary working?

It was hoped that the work of the project would contribute to young peoples appreciation of the complementary roles of science and religion and to help them to evaluate moral and social issues related to science and its applications.

More specifically the project sought to achieve the following:

- A firm acknowledgement that while discussion about the impact of science is a good thing, young people should have a sense that there are a range of value systems that people apply.

- That RME and other humanities teachers are able to make use of real science or likely issues arising from scientific developments.
- That science teachers feel confident to draw on support and expertise of their RME and humanities colleagues.

The project was jointly conducted by the Scottish Council for Research in Education Centre (the SCRE Centre) and the School of Education at the University of Glasgow and the Scottish Schools Education Research Centre (SSERC).

### 1.1 CONTEXT AND JUSTIFICATION FOR THE PROJECT

This section of the report highlights a number of relevant publications and ongoing academic work which underpinned the approach taken by the project and its early planning.

Despite significant changes in science curricula to include areas of contemporary science and its impact on our lives, many teachers have difficulty in changing their practice to enable this type of approach. The HMIE (Scotland) report [1] *"Improving achievement in science in primary and secondary schools"* cites as one of its main areas for improvement that:

*Schools and education authorities need to take steps to encourage discussion of social, moral, and ethical issues; and include key areas of contemporary science to help prepare all young people for the science of the 21<sup>st</sup> century.*

Research evidence indicates that many science teachers lack the skills and confidence to initiate and manage classroom discussions, yet view this kind of exploration as vital in building self-confidence and developing lines of critical thinking. There is a view that they could benefit from support in this area from teachers of

[1] Improving achievement in science in primary and secondary schools.

<http://www.hmie.gov.uk/documents/publication/iais.pdf>

[2] Religious and moral education a portrait of current practice in Scottish secondary schools.

<http://www.hmie.gov.uk/documents/publication/rmepcp.html#2>

religious and moral education, who habitually use discussion techniques. A recent RME HMle report [2] states that:

*There is much scope for schools to link themes within religious and moral education to other areas of the curriculum such as science, for example through the study of ethical, social, and moral issues.*

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This report goes on to acknowledge that RME teachers feel limited by their knowledge and understanding of science and that this may constrain the discussion in topic areas, which they feel confident to explore with their pupils.

In his exploration of the science/religion issue, one of the leading thinkers in this field, Reiss [3], states that:

*teaching about aspects of religion in science classes could potentially help students better understand the strengths and limitations of the ways in which science is undertaken, the nature of truth claims in science, and the importance of social contexts for science.*

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He acknowledges that this is not easy but suggests that, if done well, it can be motivating and fulfilling for students. He recently stated [4]:

*A person can have more than one worldview and there are many worldviews other than religious ones but the religious worldview is a powerful and important one for many people. It provides a lens through which the world, including those aspects of the world that science focuses on, can be viewed. Much of the science education literature ignores the science/religion issue. However, a growing number of studies are trying to find effective ways of understanding the issues.*

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and went on to say that there was little to be gained by ridiculing the non-scientific world view and pointing out that it was perfectly possible for a science teacher 'to be respectful of the positions that students hold, even if these are scientifically limited, indeed, to engage with these positions, while clearly and non-apolgetically but sensitively helping students to understand the scientific worldview on a particular issue.'

Schreiner [5] describes the importance of discussion in science where young people are encouraged to see connections between science and ethical and religious viewpoints particularly in areas such as environmental protection and sustainable development. He argues that this helps to motivate students acknowledging their cultural diversity and varied interests.

Cooling [6] explores the way in which scientific views and religious views can be seen by young people as merely conflicting opinions suggesting that this contributes to difficulties in the teaching of religious education, particularly if science is taught in a vacuum as though it has no religious context.

In a recent publication Jones *et al* [7] describe the ways in which ethical thinking should be encouraged to develop as children move up through their schooling and indicates that this should be done by using carefully planned progression and the use of appropriate resources to promote discussion and well planned CPD for teachers.

Acknowledging this ongoing work the Searching for Meaning project sought to encourage science and RME teachers to work together, addressing common aims though a well resourced CPD project, with the support of many of the stakeholders in both science and RME teaching.

- [3] Reiss, M.J. (2008). Should science educators deal with the science/religion issue? *Studies in Science Education*, **44**, 157-186.
- [4] Reiss, M.J. (2009) Imagining the World: The Significance of Religious Worldviews for Science Education, *Science & Education*, **18**, 783-796.
- [5] Schreiner, C. (2006), Exploring a ROSE-Garden: *Norwegian Youth's Orientations Towards Science - Seen as Signs of Late Modern Identities*, Faculty of Education, University of Oslo.
- [6] Cooling, T. (1990). Science and Religious Education - Conflict or Co-operation? *British Journal of Religious Education*, **13**, 35-42.
- [7] Jones, A., McKim, A. and Reiss, M. (Eds.) (2010), *Ethics in the Science and Technology Classroom: A New Approach to Teaching and Learning*, pp 55-67. Sense, Rotterdam.

# 2

## Aims and objectives

The primary aims of this project were, as stated in the introduction, to investigate two questions:

- Can science and RME teachers work together on themes in a way which will enhance pupils' understanding of science/religion issues?
- What are the resource and CPD needs of both groups and can we establish an effective model for interdisciplinary working?

In addressing these questions the project set out a number of specific research and development objectives:

- (i) To identify and characterise values, views, attitudes and beliefs amongst teachers of science and RME/RE, related to areas where controversy between science and faith exist.
- (ii) To develop resource materials, combined with a programme of professional development, that will help enhance knowledge and understanding about the science and related issues amongst science and RME/RE teachers in these areas.
- (iii) To pilot the resource materials and professional development programme with 80 teachers from approximately 40 schools across 4 Local Authorities and use data from this pilot to inform refinements and improvements.
- (iv) To use baseline research and piloted materials to increase both collaborative interaction and mutual trust and understanding between teachers of science and RME/RE.
- (v) To share the results of the CPD programme and evaluations with the advisory group, in order to develop a model for inter-disciplinary working in the teaching of scientific and moral issues related to contemporary science.
- (vi) To produce a report and promote the findings and recommendations to key organisations responsible for relevant policy and practice in Scotland and England (for example HMIE and Learning and Teaching Scotland [LTS]). This would take place through a variety of platforms including presentations at national conferences, publication in the literature and offering development materials to organisations (for example to the National Science Learning Centre).
- (vii) To make support materials available through open access websites.



# Methodology

**This section summarises the evaluation methodology and the various strands of the research. It begins with a simple table describing each of the evaluation activities in chronological order before going on to provide additional detail of the method and response rates and reflections on experience of their use.**

Early in the project development the evaluation team from the University of Glasgow and the Project leader from SSERC agreed that a key factor in their choice of evaluation method, concerned the formative nature of Action Research. Formative evaluation allows a project to analytically capitalise on ongoing evaluation activities and findings to develop project work in a way/direction which best ensures success. Traditional summative only approaches to evaluation require a project to run its course before 'learning the lessons'. This means that lessons from the work cannot be capitalised on in any systematic fashion.

Moreover, the team also believed that the evaluation strand of the project should not come to dominate the project work or impose additional burden on the project participants. It was for these reasons that a number of planned evaluation activities were altered to reflect our experiences and the feedback from participants.

**Table 1 - Evaluation activities**

Evaluation Activity	Dates
Baseline survey of RME and science teachers	Summer term 2011
Observation of 3 main CPD events	September 2011
Intermediate survey	November 2011
Reflective diaries with participating teachers	January-February 2012
Final survey	Summer term 2012
Observation of 3 CPD feedback sessions	June 2012
Case studies of schools	July to December 2012

Copies of all research instruments are available from the SCRE Centre on request.

## 3.1 BASELINE SURVEY OF RME AND SCIENCE TEACHERS

Prior to the development of substantive project work a baseline postal questionnaire survey was carried out during the Summer term 2011. The questionnaire largely comprised closed questions, however, a number of open questions were included to allow respondents to make specific and/or detailed comment.

The primary aim of the survey was to establish the underpinning views and attitudes to the teaching of ethical and moral issues associated with contemporary science amongst RME and science teachers. Information gathered from the survey was to subsequently inform the development of project modules of learning, CPD resources and professional development activities which were developed by the Project Leader with some input from a professional reference group.

The survey included all secondary schools in 8 Scottish local authorities. These authorities were selected to include a wide geographical and demographic distribution of schools. In total 124 schools were included in the survey. In addition questionnaires were also sent to the Science Learning Centre in North East England for distribution to approximately 100 schools. This centre covers Durham, parts of North Yorkshire, Teeside, Sunderland, Northumberland and Newcastle.

Selected schools were sent 2 questionnaires, postage paid return envelopes and included instructions to distribute one questionnaire each to a science and an RME teacher. Final responses to the survey were included in the database in July 2011.

# 3

## 3.2 OBSERVATION OF THE THREE CPD EVENTS

Three CPD sessions were held in different locations across the country in September 2012. Each session included 15 - 30 participating science or RME teachers. A small number of primary teachers with previous experience of SSERC work also took part in 2 of the events. Sessions were conducted at the end of the teaching day (twilight sessions) and each event followed the same format. This included, an input from the project leader on the range of materials available which could support science RME joint working, suggestions on how they might be used and an indication of how the project could help support participating schools and teachers. Two researchers attended each of the three CPD events and observed participants' reactions to the presentations. In all 3 sessions both science and RME teachers were very positive about the project presentation and the potential to develop joint work with each other. Participants were particularly enthusiastic regarding the materials on display.

## 3.3 INTERMEDIATE SURVEY

Shortly after the CPD event participating teachers were sent a questionnaire. This survey sought information regarding their CPD experiences, their plans for taking the joint science/RME work forward and any additional CPD requirements they felt necessary to support the work. In addition the questionnaire asked respondents to indicate whether they would be willing to become reflective diary volunteers (see 3.3). Twenty-nine out of 55 participating teachers (53%) returned questionnaires.

## 3.4 REFLECTIVE DIARIES WITH PARTICIPATING TEACHERS

During the initial CPD sessions the researchers took the opportunity to inform participants about the project's evaluation and the action research nature of the work. They suggested to the audience that one of the best ways to gather information on the developing project would be via a reflective diary. This would involve a number of volunteer participants completing a short note of their project experiences over the preceding month or so. The researchers stressed that they were not

expecting a formal report and that a paragraph or two under several headings was all that would be required. Immediate feedback from teachers present at the session suggested that this request would present few if any problems.

Following the responses to the intermediate survey the research team identified 11 diary volunteers (20% of teachers who participated in the CPD). The first request for feedback via a reflective diary was sent out to participants early in 2012. After a reminder 2 weeks later we had received only 3 responses, and one of those was to inform us that the teacher had decided to take early retirement and had therefore withdrawn from the project.

## 3.5 FINAL SURVEY

Towards the end of the summer term 2012 the final survey was distributed to the teachers who had participated in the original CPD. As in the 2 previous surveys, the questionnaire largely comprised closed questions, however, a number of open questions were included to allow respondents to make specific and/or detailed comment. This questionnaire sought to assess the impact of the project on teachers practice, their teaching skills and document any joint RME/science work that had developed over the period. Twelve out of the original 55 participating teachers completed this final survey (22%). This was a substantially lower figure than the 53% (29) who completed the intermediate survey.

## 3.6 OBSERVATION OF THE THREE CPD FEEDBACK SESSIONS

Participants from the original CPD sessions were invited to take part in a follow-up session at the end of the 2012 summer term. Again members of the research team attended these sessions. Compared to the initial CPD sessions, markedly fewer teachers attended. Discussions with the project leader and feedback from both attending and non-attending teachers suggested that the timing of these events was not entirely suitable. Many teachers were involved in examination preparation and support as well as end of term activities and trips with pupils which made attendance difficult. Reflecting on findings from the evaluation would also suggest that some

teachers, who had been unable to realise their initial plans, felt less inclined to attend these sessions. At each session a number of teachers did speak about what they had developed over the period and their experiences of working with RME or science colleagues. With a few exceptions these sessions indicated that in general teachers had realised less than they had initially hoped for in the work. In all cases this did not reflect a lack of enthusiasm or commitment to the project but indicated teachers' workload and timetabling commitments.

### 3.7 CASE STUDY SCHOOLS

Following the feedback sessions run in the summer term and discussions with the project leader it was decided to conduct case studies in three schools that had developed successful examples of joint science/RME work. These cases involved interviews with involved science/RME teaching staff and focus group discussions with pupils who had experienced the joint work activities/programmes. Interviews with staff focused on the nature of the work, impact on staff and pupils, resource implications, future developments and sustainability of the initiative. Pupils were asked about their experiences of the programme/activities, how the joint RME/science work compared with their general experiences of school work and how the programme had impacted on them. The 3 selected schools were from different local authorities and different geographical areas. One was based in an east coast town, another on the outskirts of a major central belt city and the third was in a rural area of the Scottish Borders. While all 3 schools were initially willing to take part in the case study strand one of the schools reported that staff absence had meant curtailing their project developments and saw little added benefit to us from visiting the school. They did however provide some additional written comment which has been included in discussion of the findings. Reports from the 2 remaining case study schools are reproduced in full in the appendix.

### 3.8 APPROACH TO ANALYSIS

Analysis of the 3 questionnaire surveys was conducted using SPSS (Statistics Package for the Social Sciences) and largely comprised the running of frequencies, cross-tabulations and significance tests (using Chi square) to identify any major differences between the responses of science and the responses of RME teachers. Where significant differences are reported these are at the 1% level (0.01) unless otherwise stated.

Analysis of interview data was conducted on a thematic basis organised around the main research questions and related interview schedules. Interviews and focus group discussions were recorded and fully transcribed. Transcriptions were then organised by question and grouped under the appropriate research question for summarising.

There were too few reflective diaries submitted to allow for any meaningful analysis to be conducted. However, wherever appropriate, comments from reflective diaries are used to inform specific points or conclusions.

# 4

## Main findings

**In this section we describe the main findings from the project. We have divided this into three sections. The first section reports on the findings from the baseline survey, the second section reviews the findings from the intermediate survey and the third section reports on the findings from the final survey and case study material.**

We have adopted this structure to give the clearest insights into three distinct stages in the project life.

- 1) the context in which the project began; the attitudes and dispositions of teachers towards the proposed development of the project;
- 2) evaluation of the CPD and initial ideas for developing of the work;
- 3) subsequent developments and impact of the work.

### 4.1 FINDINGS FROM THE BASELINE SURVEY

This section summarises the main findings from the baseline survey which took place in the Summer term 2011. Findings from this survey were previously reported on in full in the interim report of July 2011.

The questionnaire largely comprised closed questions, however, a number of open questions were included to allow respondents to make specific and/or detailed comment. The questionnaire gathered information on the background of teachers and their experience, current practices in relation to subjects they worked with, and collaborative potential for joint working between science and RME.

### 4.2 WHO RESPONDED?

In total 106 questionnaires were returned. These were overwhelmingly from Scottish schools (99). Table 2 details responses by subject. In Scotland, with 124 schools included in the survey and with 2 potential respondents per school (2 schools returned 4 responses) this represents an overall response rate of 40%. This compares very favourably with recent postal surveys conducted by the SCRE centre where response rates of between 15% and 25% would be more typical.

Moreover, the responses from science and RME teachers were relatively similar in number (see Table 2). On the other hand, the response rate for NE England is likely to represent just over 5% of the proposed sample. With so few responses from schools in England we are unable to make any meaningful comparisons between respondents in the 2 countries.

**Table 2 - Responses by subject**

Teachers	Frequency	Percentage
Science	56	53
RME	49	46
Teach both	1	1
<b>Total</b>	<b>106</b>	<b>100</b>

### Background

Respondents were often experienced teachers, 41% had taught for 16 years or longer, and almost half were in promoted positions (25% faculty heads and 24% principal teachers). The majority were female (61%) and almost all respondents worked full-time (93%). Eighty-two percent had a PGCE/PGDE qualification.

The profile of science and the profile of RME respondents were very similar. There was no indication of significant differences in gender, age, the size of schools in which they taught, whether they worked full or part-time, or in the number of years teaching. This correspondence is important, reducing the potential influence of confounding variables and allowing us to make more straightforward comparisons between the 2 groups. Having said that, there was one significant difference between science and RME teachers - in relation to their position within the school. While 36% of science teachers were *faculty heads* only 5% of RME teachers were in such a position. This probably reflects the fact that most RME staff work in small or single

person departments which do not have a Head of Department or Faculty Head. On the other hand, 39% of RME teachers occupied *principal teacher* positions compared to 16% of science teachers. The proportions of *class teachers* in each of the 2 groups was more similar, 47% of science teachers and 54% of RME teachers were class teachers.

## CURRENT PRACTICE

### 4.3 WORKING WITH COLLEAGUES

Both science and RME teachers were most likely to work with colleagues from their own subjects (see Table 3). Table 3 also provides additional comparative detail by highlighting where significant differences, between science and RME teachers, occurred in their working relationships with different groups of colleagues.

Unsurprisingly, science teachers were more likely than RME teachers to have collaborated on curricular developments, taught with, and shared ideas with other science teachers. Again unsurprisingly, RME teachers were more likely than science teachers to have collaborated on curricular developments with RME colleagues. Interestingly, there were no significant differences between science and RME teachers in relation to teaching together or sharing ideas with other

RME colleagues. This may, in part, reflect a lack of opportunity on the part of RME teachers (i.e. working in small or single person departments). Beyond their own subject areas RME teachers were significantly more likely than science teachers to collaborate on curricular developments and teach with colleagues from social science subjects and humanities. Science teachers, on the other hand, were significantly more likely than RME teachers to have collaborated with Maths colleagues on curricular developments (5% level) or to have shared teaching ideas with them. However, both groups were 'unlikely' to have taught with maths colleagues (4% of science teachers and 3% of RME teachers noted teaching with maths colleagues). Interestingly there were no significant differences in the indicated relationships between science and RME teachers and their colleagues teaching languages (including English) and colleagues teaching IT subjects. In both groups around 1 in 5 teachers had collaborated on curricular developments with language colleagues but only 1 in 20 had taught with them. Curricular collaboration and joint teaching with IT subjects was very low among both science and RME teachers.

**Table 3 - Significant differences in professional relationships with colleagues**

Colleagues %	Formally collaborated on curricular developments	Have taught together	Have shared ideas for teaching
Colleagues who teach science subjects	Sci 89 RME 4	Sci 48 RME 10	Sci 66 RME 37
Colleagues who teach RME	Sci 4 RME 67	Sci 5 RME 17	Sci 23 RME 21
Colleagues who teach humanities or social subjects	*Sci 14 RME 47	*Sci 5 RME 20	Sci 36 RME 41
Colleagues who teach mathematics	*Sci 14 RME -	Sci 4 RME 2	Sci 59 RME 20
Colleagues who teach languages (including English)	Sci 14 RME 18	Sci 5 RME 4	Sci 52 RME 41
Colleagues who teach IT subjects	Sci 9 RME 6	Sci 6 RME 2	Sci 31 RME 27

Figures in bold represent significant differences.

\* significant at 5%(0.05) level.

# 4

**Table 4 - Subjects that RME and science teachers work most closely with**

Subject	% RME teachers	Subject	% Science teachers
<b>Social subjects/humanities</b>	<b>51</b>	<b>Maths</b>	<b>26</b>
Creative and Aesthetic subjects	17	Science	20
Languages (incl. English)	17	Languages (incl. English)	13
Science	5	Social subjects/humanities	9
Home Economics	3	Technical subjects	9
Technical subjects	3	IT subjects	7
PE	2	Creative/Aesthetic subjects	6
PSE	2	PE	4
RME	2	Home Economics	4
-	-	Admin/Business studies	1
-	-	PSE	1
<b>N=65</b>		<b>N=70</b>	

#### 4.4 WORKING WITH OTHER SUBJECTS

RME teachers were most likely to work closely with social subjects/humanities while science teachers were most likely to work closely with maths colleagues. Both groups of teachers were unlikely to work with colleagues teaching IT and administration/business studies.

When asked which subjects they worked most and least closely with some interesting differences between science and RME teachers appeared. Table 4 details the subjects most closely worked with while Table 5 lists those least closely worked with.

RME teachers worked most closely with social subjects and humanities and least closely with mathematics. Science teachers, on the other hand, worked most closely with mathematics and least closely with creative and aesthetic subjects.

Only 2% of RME teachers reported working most closely with other RME teachers. This may justify our earlier conclusion that RME teachers are likely to work in small or single person departments.

#### 4.5 CONFIDENCE TO TEACH

Respondents generally reported themselves as confident teachers. Asked to indicate teaching confidence on a 5 point scale with 1 representing 'very confident' and 5 'a lack of confidence' just over three quarters of teachers (76%) indicated 'very confident'. A further 19% indicated 2 (confident). There were no significant differences between science and RME teachers.

However, when asked to indicate their confidence in teaching 'science facts' and in 'teaching ethical and moral issues' significant, but unsurprising, differences emerged. Eighty-four percent of science teachers compared to 14% of RME teachers indicated they were 'very confident' in teaching science facts. On the other hand 78% of RME teachers and 18% of science teachers were 'very confident' in 'teaching ethical and moral issues'.

Thirty-six science and 26 RME teachers provided additional comments related to their teaching confidence and their experience of teaching on the others area of specialism. Both science and RME teachers suggested that increased teaching experience promoted their comfort in teaching on the others' specialism.



*30 years of experience has some benefits! Happy with sciences and have a good background of other areas - also like to get pupils discussing listening and thinking about things outside of pure science.*

*Science teacher*

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A number of respondents also pointed out that science and RME were not mutually exclusive subjects and overlapped in a number of areas. For example,

*[Advanced Higher] Biology and CfE raises some moral and ethical issues such as Stem Cell use, DNA profiling etc. so I am quite happy to discuss the ethical issues reflecting these topics.*

*Science teacher*

----

RME teachers also pointed out that in the RMPS Higher and Intermediate 2 - scientific method, the Big Bang and the theory of evolution are explored.

A number of science teachers also indicated that they had a commitment to addressing ethical and moral issues in their teaching of science. For example,

*Ethics very important regarding scientific developments re genetic engineering, cloning, DNA testing, therefore, has an important place in science curriculum.*

*I am trained and qualified to teach science facts I believe all teachers have a responsibility to encourage discussion of ethical and moral issues in the context of their subject, and to act as a role model for pupils in a world where this is not always provided at home.*

*Science teacher*

----

A few RME teachers reported coming to teaching from an engineering or science background which meant that they were already familiar with science concepts.

There were a few responses from science teachers which clearly indicated a degree of anxiety over teaching on ethical and moral issues, again this was often seen as the result of a lack of relevant experience and/or knowledge. For example,

*It depends on how informed I am of cases and can feel uncomfortable with pupil opinions.*

*I've only limited experience teaching ethical/moral issues.*

*I am fairly confident in my teaching practice within my subject area and although we do on occasion deal with complex moral/ethical ideas/issues I do not feel confident in my ability to teach how to respond and feel about different opinions.*

*Science teachers*

----

**Table 5 - Subjects that RME and science teachers work least closely with**

Subject	% RME teachers	Subject	% Science teachers
<b>Maths</b>	<b>33</b>	<b>Creative/Aesthetic subjects</b>	<b>26</b>
PE	16	Languages (incl. English)	19
Technical subjects	11	Social subjects/humanities	16
Science	11	RME	13
Home Economics	8	PE	6
Languages (incl. English)	7	Home Economics	6
Creative and Aesthetic subjects	5	IT subjects	4
IT subjects	5	Technical subjects	4
Admin/Business studies	3	Admin/Business studies	3
<b>N=61</b>		<b>N=67</b>	

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**Table 6 - Teachers indicating 'very confident' in addressing the following questions**

<b>RME teachers (N=49)</b>	<b>%</b>	<b>Science teachers (N=53)</b>	<b>%</b>
How can there be a God and science?	82	Is preserving the Planet's resources an issue for science?	74
Did God die in the big bang?	71	Should DNA be used to profile people?	59
If stem cell research can save lives then why is it an ethical issue?	69	Is stem cell research ethical?	51
Should science and medicine allow parents to select embryos which are free from a particular disease?	65	Is it morally wrong to let parents have IVF treatment and then choose embryos which are free from a disease?	51
Is preserving the Planet's resources a faith issue?	59	Should scientists have invented the atom bomb?	44
Will scientific progress feed the world and end poverty?	33	Should religious views affect science?	36
Can science solve our environmental problems?	31	Did God make the world?	30

#### 4.6 CONFIDENCE IN DEALING WITH PUPIL QUESTIONS

RME teachers appeared more confident than their science colleagues in addressing ethical and moral issues. Teachers were presented with a number of 'pupil questions' and asked how confident they would feel in engaging pupils in discussing them. Again responses were recorded on a 5 point scale with 1 representing 'very confident' and 5 'a lack of confidence'. Although science and RME teachers were asked slightly different questions each question bank explored a range of issues concerning moral, ethical and scientific fact. Table 6 details the percentages in each group indicating 'very confident'.

The findings in Table 6 suggest that RME teachers were likely to feel more confident than science teachers in dealing with ethical and moral issues.

#### 4.7 PUPILS' VIEWS ON THE RELATIONSHIP BETWEEN RELIGIOUS AND SCIENTIFIC PERSPECTIVES

The majority of respondents (59%) believed that pupils thought science and religion offered conflicting perspectives. Table 7 summarises the views of teachers on how they thought pupils viewed the relationship between science and religion. Most commonly they suggested that pupils understood science and religion as offering conflicting views. While there was broad agreement between both sets of teachers on pupils' perceptions of science and religion there was also significant differences (5% level) in 2 respects. Almost a quarter of science teachers and no RME teachers indicated 'don't know' while 70% of RME teachers indicated 'offering conflicting perspectives' compared to 52% of science teachers.

**Table 7 - How do pupils see religious and scientific views?**

<b>%</b>	<b>Completely unrelated</b>	<b>Offering conflicting perspectives</b>	<b>Offering complementary perspectives</b>	<b>Don't know</b>
RME teachers (N=46)	15	70	15	0
Science teachers (N=54)	15	52	11	22



Seventy-seven teachers provided additional comment on their responses to this question. Their comments generally reinforced the findings in Table 6, with the following examples underlining the perception that pupils regard science and religion as representing conflicting perspectives,

*Most pupils do not see any relation between scientific views and religious views as science views are often seen as fact whereas religious views are seen as opinion belief.*

*Pupils I have taught seem to be aware that religious beliefs are based on faith but science tries to be based on fact and evidence. They think the two are mutually exclusive.*

*A science teacher can't believe in God' is what I was recently told by an S5 pupil.*

*Science teachers*

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*Generally speaking pupils perceive science to be about provable truth and religion to be about made up stories.*

*Most pupils see them as completely unrelated or conflicting.*

*Pupils see science as teaching facts, religion as teaching opinions. They perceive that science shows religious views to be untrue.*

*RME teachers*

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A number of comments suggested that while students could struggle with each point of view and seldom saw the connections, many pupils did relish the debate it generated. This appeared particularly true for older pupils. Some teachers also suggested that the way the issues

were presented and taught were important in addressing the view that the 2 subjects presented conflicting views. For example,

*[Pupil perspectives are] key to the higher RMPS class. Many pupils also take biology - there is a natural link between some aspects of the course.*

*Initially pupils see science and religion as conflicting, however, after discussion most pupils see them as complementary.*

*Those who do not do RMPS would say they conflict. Those who do RMPS say that they are complementary.*

*RME teachers*

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There was a suggestion from a small number of teachers in denominational schools indicating that, as a result of the way religious concepts were covered in the curriculum, there was less of a distinction in pupils' views of science and religion. However, there was also a view from some science teachers that the 2 subjects were recognised by pupils as presenting conflicting views because they were based on quite different philosophies. As 1 science teacher put it,

*Scientific belief is based on demonstrable and verifiable facts. Religious belief is based on unquestioning faith, often in spite of demonstrable verifiable facts. The conflict is obvious to most pupils.*

----

Some RME teachers also revealed their own strong views on the subject,

*Before they reach secondary school pupils have been persuaded that the 'false dichotomy' above is factual.*

*Pupils frequently have misplaced faith that science is more reliable as a way of understanding life and the world.*

*RME teachers*

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**Table 8 - Working with RME or science colleagues**

Activities	% Frequently/Sometimes		% Rarely/Never	
	RME	Science	RME	Science
We are involved in cross-curricular initiatives	28	14	73	87
We team teach	2	-	98	100
We share teaching resources	26	10	74	91
We discuss issues of common interest	49	26	52	75
I have supported RME teachers when they seek help with science facts or issues	Not applicable	29	Not applicable	71
I have supported science teachers when they seek help with religious and moral issues	15	Not applicable	84	Not applicable
We have worked together in other ways	27	29	73	72
<b>N = (RME=47, Sci=52)</b>				

**Table 9 - Curricular areas and topics offering most potential for collaboration between science and RME teachers**

Science teachers	RME teachers
IVF, artificial fertilization, embryonic development, 'Designer babies'	Big Bang theory/origins of the Universe/creation stories/Cosmology in relation to 'first causes' argument [i.e. that something caused the Universe to exist] S2 creation Unit
Evolution/Natural selection	Medical Issues/Medical ethics including Stem cell research, cloning
Bio ethics/Ethical considerations of GM foods	Evolution
Ethical considerations of, medicine, Genetic engineering, gene therapy, cloning	Environmental issues (e.g. global warming)/ Environmental ethics
Moral and ethical dimensions of science research	Christianity: Belief and Science Unit at Higher/ The Belief and Science Unit in Higher/Int 2 RMPS
Stem cell research	Abortion
DNA, Genetic profiling	Existence of God
Big Bang theory/Astronomy	Euthanasia
God and science/Metaphysical implications of some Physics, Chemistry and Biology	Genetic engineering
Discoveries and advances (CfE topical science)	Origins of life/the human condition
Origin of life	God vs. science, revelation or scientific method
Animal welfare	Higher - Morality in the modern world
Ideas behind faith and belief	Scientific Methodology
	Organ transplants
	Methods used for seeking truth
	Miracles
	Animal testing

## 18 Searching for Meaning - Science and Religious Education teachers working together

#### 4.8 SCIENCE AND RME TEACHERS WORKING TOGETHER

RME teachers were more likely than their science colleagues to report being involved with science colleagues in joint initiatives/activities than science teachers were with RME colleagues. Table 8 summarises the results.

Table 8 also demonstrates that, irrespective of subject area, involvement does not include team teaching.

Examples of working together detailed by science and RME teachers included:

- Developing areas such as AifL techniques and ways of assessing and recording progression for *CfE*.
- Science teachers providing support for S1/S2 pupils in projects in RME about the Big Bang, evolution and 'intelligent design' theory.
- Science teacher support and input for curriculum areas e.g. citizenship issues and Higher RMPS Christianity: Belief and science, genetic engineering, cosmology.
- Observing each others' lessons.
- One example of team teaching on scientific method in order to compare and contrast with revelation as a means of understanding.
- Debates - the scientist and the Christian on evolution.
- Co-teaching S1 unit on sex reproduction and relationships 'Called to Love' (Catholic sex education scheme of work).

#### 4.9 CPD INVOLVING SCIENCE AND RME TEACHERS

None of the respondents had been involved in any training or CPD involving science and RME teachers.

#### COLLABORATIVE POTENTIAL

#### 4.10 IDENTIFYING CURRICULAR AREAS FOR COLLABORATION

Both science and RME teachers regarded the 'Ethics of medical and scientific developments' and 'Evolution' as areas for cooperation. Table 9 summarises teachers suggested curricular areas for collaboration.

There was a marked degree of similarity in the suggestions made by science and RME teachers on what curricular topics offered the most potential for cooperation. Table 9 summarises responses in rank order - from most to least frequently cited responses.

The 'Ethics of medical and scientific developments' and 'Evolution' were seen as areas for cooperation by both groups of teachers, RME teachers were more likely than science teachers to suggest the 'Origin of the Universe' as an area for collaboration. Findings from this section of the questionnaire in particular were used by the project leader to develop topics and support materials for the CPD sessions.

*While the responses from almost all science and RME teachers indicated the possibility of engagement in curricular areas or topics; comments from a few science teachers suggested reservations about cooperation between the two subjects.*

*Moral and ethical topics in the context of science could be discussed with other teachers (not necessarily RME teachers). Religion has no place in the school. You can't teach faith.*

*All science topics which contain ethical or research opinions/reasoning could be linked however I think this is the limit of cooperation.*

*Science teachers*

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#### 4.11 THE IMPACT OF COLLABORATION BETWEEN SCIENCE AND RME

The majority of teachers from both subject areas felt that collaboration between the 2 subjects would have a beneficial impact on both their teaching and the experiences of pupils.

While the majority of respondents agreed that closer links between science and RME would increase their workload (68% science 62% RME), the majority also indicated that closer links would produce a number of positive outcomes and clearly welcomed such developments.

Table 10 summarises the perceived impact of closer collaboration between science and RME teachers.

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**Table 10 - The impact of closer links between science and RME**

Closer links between science and RME would...	Science/RME	% Agree/strongly agree	% Disagree/strongly disagree	% Don't know/unsure
be welcome	Science	79	14	7
	RME	94	2	4
improve the teaching of pupils in the school	Science	75	13	13
	RME	96	-	4
increase my workload	Science	68	18	14
	RME	62	34	4
increase support for my teaching	Science	54	24	22
	RME	80	4	15
improve the coherence of the curriculum	Science	68	23	9
	RME	92	-	8
have no impact at all	Science	8	77	15
	RME	-	92	8
promote the development of more informed opinions among pupils	Science	87	11	2
	RME	92	2	6
contribute to the implementation of Curriculum for Excellence	Science	80	7	13
	RME	94	-	6
support the development of more open and tolerant attitudes among pupils	Science	82	11	7
	RME	79	2	19

Interestingly, there were a number of statistically significant differences between science and RME teachers in relation to the impact of closer collaboration. RME teachers were significantly more likely than their science colleagues to agree that closer links between science and RME teachers would:

- improve the teaching of pupils in the school (95% RME, 76% science).
- increase support for their teaching (83% RME, 54% science).
- improve the coherence of the curriculum (95% RME, 69% science).
- contribute to the implementation of *CfE* (100% RME, 84% science).

**Table 11 - Priorities for supporting collaboration between science and RME**

Support priorities	Science/RME	Medium or high priority	Low priority or not required
Joint in-school meetings	Science	61	39
	RME	79	21
Joint CPD/in-service	Science	67	33
	RME	74	27
Greater knowledge and understanding of the other subject	Science	86	15
	RME	90	10
Planned collaboration	Science	80	20
	RME	96	4
Production of joint resource materials	Science	66	34
	RME	78	22

#### 4.12 PRIORITIES TO SUPPORT COLLABORATIVE WORKING

Science and RME teachers agreed that a number of activities should be prioritised to support collaborative working between science and RME.

Table 11 summarises the responses from science and RME teachers. 'Greater knowledge and understanding of the other subject' and 'Planned collaboration' were *the 2* activities most frequently identified by both groups of teachers as priority support activities. However, all of the suggested support activities were regarded as *medium or high priority by most respondents*.

#### 4.13 ISSUES TO BE ADDRESSED

Teachers identified a number of issues which required addressing if science and RME were to collaborate successfully in their school. Almost all comments related to practical issues concerning timetabling and workload.

The current focus on cross-curricular working and science outcomes was seen by some as a driver for greater collaboration between science and RME. There was also a strong overlap in the responses from science and RME teachers about which issues needed to be addressed if closer collaboration were to take place. These largely concerned practical issues rather than epistemological or attitudinal ones. The main issues identified by teachers were:

- Timetabling and curricular coherence - to allow joint working between science and RME to be matched up in the curriculum. Linking up with CfE experiences and outcomes.

*The unit would need to be taught at the same/similar time so particular lesson planning information was shared prior to pupils receiving it - no conflicting similar resources used where possible to ensure coherency*

RME teacher  
----

*Science works on a rota due to equipment problems - this has restricted joint work with other depts.*

*It would be essential to meet and discuss the work regularly or at least to plan its implementation and to evaluate progress.*

Science teachers  
----

- Time - to meet and find out about each other's areas and address teaching and learning issues.

*CfE encourages collaboration, however time for planning is a major issue especially with re-organisation our own courses in line with new CfE experiences and outcomes.*

RME teacher  
----

- Time - for classes to get through the prepared work practices to explore practical resourcing/ time for collaborative working.
- Pressure of workload.
- Lack of information available from each others' area of the curriculum.
- Target setting - who does what/topics/identify points of contact which could be developed by teachers.
- Funding - e.g. for supply cover to ensure projects can work effectively.
- Leadership needed to promote this/SMT being keen and open to ideas and supportive of developments.
- Access to quality resources and support materials.
- Include collaboration activities in a development target so that it can be time and resource managed.
- Motivation, goodwill and encouragement required for effective collaboration.

*It would need enthusiasm and motivation to get true collaboration. Fortunately, we have a great [Principal Teacher Chemistry] at this school but the materials would need to be very user friendly to overcome the possible resistance of teachers who would present the lessons.*

Science teacher  
----

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*If collaboration is forced it will end in disaster and foster acrimony. It is far better to play the long game and achieve the desired goals through encouragement and enlightenment.*

*RME teacher*

-----

While most teachers stressed practical issues that needed to be faced if collaboration between science and RME were to develop, there was also a small number of science teachers who had more epistemological concerns. A few of these teachers felt that working with RME would require some of the myths suggested as facts having to be challenged. On the other hand, there were numerous comments from RME teachers indicating that existing attitudes among science teachers towards religious beliefs also needed to be addressed. For example,

***The prevalent atheism that exists in science, the lack of respect shown for RME as a subject of equal and valid value.***

*Huge barriers to be broken down as many science teachers unfortunately don't see the worth of RME and wouldn't see collaboration as a priority.*

*Resistance from science dept over religious beliefs and their perception of RME.*

*It may be that science teachers require more persuading that RME teachers about the value of this enterprise but both groups will offer resistance unless/until good resources are made available.*

*Feeling from science teachers that RMPS is nothing to do with them/not of interest.*

*At present science is included as part of the RME courses. Scientists may not be convinced about the need to have RME input into science courses. I think there is a great possibility of science teachers having an input in RME classes than vice-versa.*

*The teaching of evolution as an established scientific fact rather than a theory that is open to later refutation ... Too many science teachers see religion and science being incompatible, there is a widely held belief that science disproves the existence of God.*

*RME teachers*

-----

## 4.14 FINAL COMMENTS FROM THE BASELINE SURVEY

Fifty-two teachers (49%) provided a final comment about collaborative working between science and RME teachers. The majority of these contributions indicated that measures to promote collaboration between science and RME teachers was regarded as a positive development. For example,

*I think it would have mutually beneficial implications for both subject areas, help pupils better understand the social, spiritual and physical worlds.*

*I have approached the RME department about this research and work. We welcome this approach and look forward to trialling resources.*

*This could be a positive and fruitful experience for teachers, pupils and parents. I would welcome any support or resources that would promote debate and discussion.*

*Science teachers*

-----

*It has current potential. It requires innovative and energetic teachers who want to improve the educational experiences of young people. The shift to collaboration will be difficult as there will undoubtedly be resistance from both sides. But it is well worth doing.*

*Would welcome the opportunity since it opens up the cross-curricular issues which need to be addressed.*

*Beneficial in lower years but especially in certificate classes where science and Christianity make up specific topics covered for examination.*

*Collaborative working between RME and science teachers would prevent overlaps and for each area to complement the teaching of medical/scientific issues for advancing the knowledge of pupils and to have a more in-depth understanding.*

*There are aspects of the Higher/Advanced Higher RMPS course which could benefit from some technical input from scientists - RME courses are open to discuss a variety of viewpoints.*

*There needs to be a willingness and openness on both sides to enable this. I would like to work with the science dept especially when it comes to teaching the Big Bang and evolution and allow pupils to discuss their own views and thoughts openly.*

*RME teachers*

-----



There were a few teachers who took the opportunity to reiterate the potential challenges facing such a venture.

*[Referring to 'promoting development of more informed opinions among pupils to contribute to CfE] - Clear link at Higher level - while links could be made further down the school, there is little time to allow this to happen.*

RME teacher

----

*Whilst I would find the collaboration useful especially as it would help pupils to see that being a scientist doesn't mean you can't be religious and would help them develop their own sense of ethics/morals on some very sensitive topics, time to collaborate and construct meaningful projects/resources is very limited with budgets being cut most staff are working at maximum and although I hope they too would see the value in a collaboration it is likely to fall down the list of priorities.*

Science teacher

----

Finally, there were a few, mainly science teachers, who again took the opportunity to stress their opposition in the idea of collaborative working on the grounds of philosophical difference.

*I think that RME and science are two different subjects and so there is no need to collaboratively work as there are far too many contradicting differences between the subjects relating to fact and opinion.*

*It is hard to try to teach some aspects of science (the nature of the universe evolution etc.) to a pupil who has already been instructed what they must believe by parents or religious leaders. Establishing links between science and RME could have a very negative effect in giving religious belief a credibility that has no basis in science.*

*PS A final thought - a one to one debate between a science teacher and RME teacher along the lines of the Christopher Hitchens Vs Tony Blair event might prove to be instructive or thought provoking - or just play them the video.*

*Pupils keep telling me that the scientific facts I teach are just 'my opinions'. Pupils need to know the difference. I suspect that this idea may emanate from other sources including RE. I personally am not tolerant of pupils believing in things which are not factual or*

*at least don't have some evidence there is worrying evidence that pupils believe in astrology, dream interpretation, clairvoyance, mediums, alien abductions ...*

Science teachers

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#### 4.15 SUMMARY OF FINDINGS FROM THE BASELINE SURVEY

A number of key findings emerged from the baseline survey. Perhaps of most importance was the willingness of both science and RME teachers to engage in collaborative working despite a perceived increase in their workloads and the recognition that a number of issues (including timetabling) would have to be addressed.

There was clearly a lot of scope for such collaboration, none of our respondents had been involved in any joint RME/science training or CPD and there was little evidence of pre-existing formal collaboration between the two subject areas. Moreover, both science and RME teachers agreed that a range of support activities should be prioritised including 'joint CPD' and 'planned collaboration'.

While the overwhelming picture was positive there were a small number of, predominately science, teachers who indicated that joint working between science and RME was difficult to envisage given their different philosophical underpinnings. However, support for this viewpoint should not be overestimated given the enthusiasm among both groups of teachers for greater cooperation and collaboration with each other.

#### 4.16 FINDINGS FROM THE INTERMEDIATE SURVEY

CPD sessions were conducted by the Project Leader at the end of September 2011 in 3 different venues across the central belt of Scotland. These sessions sought to introduce teachers to the developing materials and resources aimed at supporting cross-curricular working between science and RME. In total 46 secondary and 9 primary teachers attended these sessions. In addition a representative of the AstraZeneca Science Teaching Trust (AZSTT), 2 members of

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HMIe, 2 local authority education officers, and 2 SSERC employees also attended sessions.

Questionnaires were mailed to teacher CPD participants shortly after the session. Those who initially agreed to take part in a session but did not attend were also sent questionnaires. These questionnaires were designed to collect feedback on the teachers' experiences of the session and find out whether the session had stimulated cross-curricular developments in RME and science.

## 4.17 WHO RESPONDED TO THE INTERMEDIATE SURVEY?

Of the 55 teachers who attended a session, 29 (53%) returned a questionnaire. In addition 1 of the 4 non-attenders also returned a questionnaire (although they did not complete the background section of the questionnaire). Overall responses were received from 17 schools (14 secondary and 3 primary).

Twenty-eight respondents identified the area they taught, 13 taught RME, 9 science and 6 taught both subjects (4 of these were primary teachers).

Respondents were most commonly class teachers (18) or principal teachers (7) and the majority (19) had at least 6 years teaching experience. Twenty-three respondents were female, 5 were male, and all but 1 worked full-time.

## 4.18 REASONS FOR PARTICIPATING IN THE SSERC CPD

The vast majority of teachers took part in the CPD to develop their understanding of the links between science and RME and support cross-curricular working. The following responses were typical;

*To further my knowledge and understanding of the cross-curricular themes within science and RME and try to incorporate interdisciplinary learning between the two subjects.*

*Secondary Science teacher*  
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*To obtain more information about possible next steps and ideas for lessons to work together with colleagues in science dept.*

*Secondary RME teacher*  
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*Interested in ways to introduce ethics to pupils. Want to run an interdisciplinary learning project with RME.*

*Secondary Science teacher*  
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In one or two instances teachers were also encouraged to take part in the CPD because of previous positive experiences of CPD run by SSERC and/or the Project Leader.

## PARTICIPANTS' EVALUATION OF THE CPD

### 4.19 MEETING PARTICIPANTS' EXPECTATIONS

Almost two thirds of those responding (17) indicated that the session had completely met their expectations while the remainder (10) reported that the session had mostly met their expectations.

A few of the teachers indicated that the session could have been improved with additional time allocated to discussion or given over to reviewing or trying some of the activities. For example,

*I enjoyed session. Maybe doing one of the activities [some activities were just shown]*

*Secondary RME teacher*  
-----

*I feel more examples of good practice between RME and science departments in Secondary Schools could be provided to stimulate ideas of how RME and science can work collaboratively in our own schools.*

*Secondary Science teacher*  
-----

*Session was excellent - more time to look at/discuss all resources would have been good.*

*Primary teacher*  
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**Table 12 - Session outcomes for primary teachers (N=5)**

Primary teachers	Great extent	Some extent	Small extent	Not at all
Encourage you to develop cross curricular science/RME teaching	4	1	-	-
Increase your <i>confidence</i> to develop cross-curricular science/RME teaching	2	3	-	-
Introduce you to new ideas for cross curricular science/RME teaching	4	1	-	-
Provide access to appropriate resources and materials to support cross-curricular RME/science developments	3	2	-	-
Begin the process of developing cross curricular science/RME teaching	3	2	-	-

**4.20 OUTCOMES FROM THE SESSION**

Participants were asked to indicate the extent to which the CPD session had achieved a number of pre-determined outcomes. Findings are summarised for primary and secondary RME and science teachers in Tables 12, 13 and 14. These findings clearly show that the sessions were generally successful in achieving these outcomes.

*Very motivational. I came away excited and eager to develop this way of teaching within the classroom.*

*Primary teacher*

----

*It was excellent, it made me think of many ways we could work together and the resources supplied are very good and many I will use in the classroom.*

**4.21 SUMMARY OF PARTICIPANTS' CPD EXPERIENCE**

Participants also provided open summaries of their CPD experiences. Again these were overwhelmingly positive with many highlighting the quality of resources available, the opportunity to discuss potential collaboration, and the motivational nature of the session. For example,

*Secondary RME teacher*

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*Great resources and well thought out - could be adapted for use in a range of situations - inspirational to try new things in relation to inter disciplinary projects.*

*Secondary RME teacher*

----

**Table 13 - Session outcomes for Secondary RME teachers (N=13)**

RME teachers	Great extent	Some extent	Small extent	Not at all
Encourage you to develop cross curricular science/RME teaching	10	3	-	-
Increase your <i>confidence</i> to develop cross-curricular science/RME teaching	8	5	-	-
Introduce you to new ideas for cross curricular science/RME teaching	8	3	2	-
Provide access to appropriate resources and materials to support cross curricular RME/science developments	10	2	1	-
Begin the process of developing cross curricular science/RME teaching	9	3	1	-

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**Table 14 - Session outcomes for Secondary science teachers (N=9)**

Science teachers	Great extent	Some extent	Small extent	Not at all
Encourage you to develop cross curricular science/RME teaching	5	4	-	-
Increase your confidence to develop cross-curricular science/RME teaching	5	4	-	-
Introduce you to new ideas for cross curricular science/RME teaching	6	3	-	-
Provide access to appropriate resources and materials to support cross-curricular RME/science developments	7	2	-	-
Begin the process of developing cross curricular science/RME teaching	5	3	1	-

*Interesting oral and visual explanations. Good source materials. Some opportunity to chat to others and review materials on offer. Good DVD given at end.*

*Secondary RME teacher*  
-----

*Informative and inspirational. Gives motivation to try new approaches.*

*Secondary Science teacher*  
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*Worthwhile. Food for thought. Motivating as high quality materials available.*

*Secondary Science teacher*  
-----

*of embryos. Running from now until December. S1 RME - Collaborating with science department to plan an S1 unit with interlinking themes- environmental issues. Early stages of planning, hope to have unit ready by January.*

*Secondary RME teacher*  
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*We have started a unit on stem cell research with S5 which will be approximately 20 periods in RE. We are also including a lesson with the Cardinal during his visit (November) and hoping pupils will also have the benefit of his input. We are also hoping to collaborate with science on an S2 project after Christmas - swapping classrooms etc.*

*Secondary RME teacher*  
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## DEVELOPING THE WORK

### 4.22 COLLABORATIVE WORK

Participants provided details of RME/science collaborative work that they had already embarked on, or hoped to begin following their involvement in the Searching for Meaning CPD. The majority of respondents indicated having either started some collaborative work or had planned to do so in the near future. This collaboration involved a range of subjects, year groups, and approaches, for example,

*S4 RMPS - intermediate 1 unit - Morality in the modern world led to discussion with science teachers to link DNA and Stem cell research to ethics surrounding treatment*

*[Initiative involves] Science, RME and hope to involve Art teacher. Possibly S1, S2 but not finalised yet. Could also be S3, S4. Hope at least 1 afternoon as whole year group and done in groups - thinking, discussing and presenting group thoughts.*

*Secondary Science teacher*  
-----

*S5/6 - Stem cell project - Biology and RME. Week long course starting November. S5/6 - Evolution project - Biology and RME - week long course starting February.*

*Secondary Science teacher*  
-----

*We are trying to work on an S3 unit for science and RME - currently in the planning stages.*

*Secondary RME Teacher*

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Only 2 CPD participants reported that they had not, as yet, discussed collaboration with their colleagues.

#### **4.23 BARRIERS TO COLLABORATIVE WORKING**

While many of the teachers had either developed plans for collaborative working or had already begun such work, most also took the opportunity to outline the barriers or difficulties faced in developing joint RME/science work. Many of the comments made reference to a lack of available time, existing workload, and pressure on resources. For example,

*Lack of time for 'extras' in Higher course. Pressure of workload and development time required this year for CfE.*

*Secondary RME teacher*

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*Photocopying budget - no colour printing or money available to provide class sets of info. Time - courses are tight time wise and have to make time in both courses and be relevant.*

*Secondary Science teacher*

----

*More access time for RME and science teachers to meet and discuss. More time to implement.*

*Secondary RME teacher*

----

*Full sets of resources shown. Time 'ring fenced' to develop courses.*

*Secondary RME teacher*

----

A few teachers also made comments which suggested timetabling or organisational issues were presenting them with difficulties in developing their plans, while a few others suggested that senior management support would 'help' the initiative materialise.

#### **4.24 ADDITIONAL RESOURCES**

A number of teachers commented on the need for additional resources to support science/RME collaboration in their school. Some of these responses reflected previous comments on the need for more time to meet and plan or to have additional funding made available for printing. However, comments most frequently sought class sets of the resources they had seen at the CPD or additional exemplars. In one or two instances teachers requested additional CPD.

*A CPD seminar on other medical ethics issues would be valuable. Perhaps resources for workshop type activities would be useful.*

*Secondary RME teacher*

----

*Examples of collaborative working between RME/science in Secondary Schools would be beneficial. Additional time provided for science and RME colleagues to collaborate plan and prepare resources which promote pupil learning.*

*Secondary Science teacher*

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*In house CPD to develop units.*

*Secondary RME teacher*

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*Perhaps some exemplars of topics or lessons which have been run in secondary schools already.*

*Secondary Science teacher*

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#### **4.25 TEACHERS' FINAL COMMENTS**

Ten teachers, 7 of whom were RME teachers, registered a final comment. All were very positive about the initiative and their involvement. For example,

*The project is an excellent idea and many people don't realise how science and RME could work together.*

*Secondary RME teacher*

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# 4

*I think this project is very interesting and useful. It has helped me come up with new ideas for teaching strategies and also helped me develop my own knowledge of the themes, especially designer babies.*

Secondary RME teacher

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*Great resources and ideas. Keep them coming.*

Secondary Science teachers

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## 4.26 SUMMARY OF FINDINGS FROM THE INTERMEDIATE SURVEY

Teachers involved in the Searching for Meaning CPD sessions were overwhelmingly positive about the experience, the project leader's input and the resources and materials they encountered.

The majority of participants' expectations of the session were met in full and many had obviously followed up the CPD with plans for developments in their schools. Indeed a number of teachers indicated that they had already embarked on collaborative working with colleagues.

## 4.27 FINDINGS FROM THE FINAL SURVEY AND CASE STUDY MATERIAL

Questionnaires were mailed to teacher CPD participants in early June 2012. These questionnaires were designed to collect information on the impact of the CPD and the development of joint RME/science programmes in participants' schools.

## 4.28 WHO RESPONDED TO THE FINAL SURVEY?

Of the 55 teachers who attended a CPD session, 12 (22%) returned a questionnaire. Of these, 6 were RME teachers, 5 were science teachers and 1 was a primary teacher. Eleven were female and 8 had been teaching for at least 6 years.

## 4.29 COMMENT ON THE FINAL SURVEY RESPONSE RATE

Compared to the response rate from the intermediate survey the response rate for the final survey is substantially lower. Comments

from attenders at CPD feedback sessions and from non-attenders, at least in part, explain the drop off in response rates. The timing of the survey, close to the end of term was probably less convenient for teachers involved in examination preparation and school trips. Moreover, we can also speculate that some teachers, who had been unable to realise their initial joint RME/science working plans, felt less inclined to complete questionnaires.

However, whilst the overall response rate for the survey is low, those who did complete the questionnaire have provided some valuable insights into what can be achieved in a relatively short period of time.

## 4.30 IMPACT OF THE PROJECT ON PARTICIPANTS

Findings from the survey suggest that the Searching for Meaning CPD and follow-up support from the Project Leader has had a substantial impact on a number of the participants and, importantly, has also been translated into changes in practice.

Of key importance in evaluating the CPD was its impact on practice. The survey asked a number of questions designed to provide information on the impact of the CPD on participants' teaching, practice and professional relationships. Table 15 summarises these findings. Generally the findings indicate that the CPD has had a positive impact in a number of areas. This is all the more encouraging given that the majority of the teachers (8 out of 12) have had at least 6 years teaching experience. Moreover, there was no evidence to suggest that the CPD had impacted more or less positively on science or RME teachers.

Several findings are particularly noteworthy, including:

- All twelve respondents indicating a wider network of colleagues;
- Ten teachers introducing CPD materials to their teaching;
- Eight teachers indicating they are more able to implement *CfE*;
- Seven teachers indicating taking on a significant role in science/RME collaboration at departmental level;
- Seven also taking on a significant role in science/RME collaboration at school level, and;
- Seven also indicating that their enthusiasm for teaching had increased.

**Table 15 - Impact of the Searching for Meaning CPD (N=12)**

Following involvement in the Searching for Meaning CPD ...	Strongly agree	Agree	Disagree	Strongly disagree	No change
My enthusiasm for teaching has increased	-	7	-	-	5
My confidence for teaching has increased	-	3	-	-	8
I have introduced the CPD materials to my teaching	3	7	1	-	1
I am more able to implement Curriculum for Excellence	2	6	-	-	4
I have a wider network of colleagues	3	9	-	-	-
I actively participate in a network of colleagues	-	7	1	-	4
I have taken a significant role in science/ RE collaboration at departmental level	3	4	1	-	3
I have taken a significant role in science/ RE collaboration at school level	3	4	2	-	3
I have taken a significant role in science/ RE collaboration at local authority level	-	1	4	1	6
I have made contributions to science/ RE collaboration at a national level	-	1	3	2	6
I am a better teacher	1	3	-	-	8
I am more positive about my career prospects	1	1	-	-	10
I have a better relationship with pupils	1	1	-	-	10
Pupils are more positive about my subject	1	3	-	-	8
Pupil achievement in my subject has improved	1	-	-	-	11
I have a better understanding of what SSERC offers	1	6	-	-	5

#### 4.31 CONFIDENCE IN DEALING WITH PUPIL QUESTIONS REVISITED

There was some evidence to suggest that both science and RME teachers felt more confident in engaging with pupils in discussing ethical and moral issues following the CPD. Teachers were presented with a number of 'pupil questions' and asked how confident they would feel in engaging pupils in discussing them. Responses were recorded on a 5 point scale from 'much more confident' to 'much less confident'. Table 16 details the numbers in each group indicating 'more' and 'much more confident'.

Table 16 suggests that in a number of areas both RME and science teachers' confidence to deal with moral and ethical issues has increased as a result of the SSERC CPD.

#### 4.32 INVOLVEMENT WITH SCIENCE/RME COLLEAGUES FOLLOWING THE SSERC CPD

Teachers were also asked to indicate the frequency of involvement in a number of areas with their colleagues teaching the other subject (science or RME). Results are presented in Table 17.

# 4

**Table 16 - Teachers indicating 'more' or 'much more confident' in addressing pupils with the following questions**

RME teachers (N=6)		Science teachers (N=5)	
If stem cell research can save lives then why is it an ethical and moral issue?	4	Should religious views affect science?	5
Should science and medicine allow parents to select embryos which are free from a particular disease?	4	Is stem cell research ethical?	4
Is preserving the Planet's resources a faith issue?	3	Should DNA be used to profile people?	3
Can science solve our environmental problems?	3	Is it morally wrong to let parents have IVF treatment and then choose embryos which are free from a disease?	3
How can there be a God and science?	2	Is preserving the Planet's resources an issue for science?	1
Will scientific progress feed the world and end poverty?	1		
Did God die in the Big Bang?	1		

Although the numbers involved are small, in comparison with the baseline survey (See Table 8), there is some suggestion that, at least among responding RME and science teachers, 'cross-curricular initiatives', 'discussing areas of common interest' and 'sharing teaching resources' may have happened more frequently since the initial CPD.

### 4.33 JOINT WORKING BETWEEN SCIENCE AND RME TEACHERS

Eight out of the 12 teachers (5 RME, 3 science) reported that they had initiated or become involved in joint RME/science work since taking part in the SSERC CPD. In one instance an RME and science teacher from the same school responded in separate questionnaires and provided 2 perspectives on the same developments.

Respondents provided comments on their work, some provided fairly comprehensive descriptions of the work, its development, noted who was involved, provided an assessment of its impact and commented on its sustainability. In other instances comments focused on only 1 or 2 of these areas.

Among the more comprehensive responses was this science teacher who described how she took the SSERC CPD materials, involved a number of

subject areas and combined them with resources from elsewhere to develop work in the school. Her summary mentions the importance of management support and also highlights some of the difficulties encountered.

*[We took the] memory box idea from [the SSERC] CPD where pupils built up the profile of a particular child, they were then faced with a situation surrounding stem cells. science taught what stem cells are, different types, how useful and got pupils to form opinions about stem cells and if they agreed or disagreed.*

*They carried out debates and class discussions to help form an opinion and then had to decide if this was right/wrong for their particular child. Resources from BBC (news articles), website euro-stem (video clips), Cyber-brain (video) demonstrating some views are biased. Involving Biology, RME, Home Economics (linking with Modern Studies). Support from faculty head of science.*

*Will introduce with all science classes next year (fits in well with topical science). Most pupils have responded well as they are aware of the link between the subjects. Unfortunately this was a pilot in science therefore not all pupils experienced the link and studied both. This should change next year.*

*Difficulties - time ... printing and laminating was required.*

*Science Teacher*

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**Table 17 - Participants frequency of involvement in following activities**

Activities (number indicating 'sometimes' or 'frequently')	RME teachers (N=6)	Science teachers (N=5)
Involved in cross-curricular initiatives	5	2
Team teach	1	1
Share teaching resources	2	4
Discuss areas of common interest	4	5
I have supported RME teachers when they seek help with science facts or issues	Not applicable	2
I have supported science teachers when they seek help with religious and moral issues	3	Not applicable
We have worked together in other ways	1	4

This RME teacher also provided a comprehensive description of the different ways in which the project had developed in her school.

*The RE department undertook to work with S2 and S6 on the ethics of Stem Cell research. S6 was covered completely in the RE dept. and the unit created is now part of the S6 course on medical ethics. As well as using the resources provided by SSERC, new materials were created in the department. During the visit of Cardinal O'Brian in November a 'Question Time' debate was held which was videoed. During this the Cardinal was a member of the audience. He has since sent us more information on the subject as he enjoyed it so much! With regard to S2, they covered what stem cell research is in Biology and then looked at the ethics of it in RE. Pupils then completed an e-portfolio using information gathered from both science and RE to write an article for other teenagers explaining stem cells and the ethics of stem cells. The whole of the RE dept. has been involved in this project. Pupils have found this project very interesting and rather different to the work they have been covering in RE.*

*RME Teacher*  
-----

Her science colleague from the same school submitted this response, highlighting how, some creativity in timetabling, was required to overcome rota issues. This teacher also mentioned issues with competing demands on her time. She also commented on parental responses to the development.

*We have run a joint science and RME project for our S2 pupils (on stem cells). This involved some creative timetabling of science groups in order to accommodate our rota system in science to meet the RME timeplan. We have also run a successful S5 project which involved the pupils organising a stem cell 'question time' which Cardinal O'Brien attended and participated in. An 'official' photograph of the Cardinal and pupils was taken for the press. The S2 pupils also completed a stem cell project at home and had to interview their parents. The feedback from the parents was very positive. They were surprised at the work being covered by their children. They were also pleased to be involved in assessing their child's work. They 'felt included'. We ran out of time in S2 and some classes did not complete the project. Demands on our time in developing and implementing new courses for CfE has restricted the time available for this project. Some teachers just felt they couldn't tackle another change. This has very little to do with the quality of the materials. It is down to workload issues - phenomenal (year on year) changes to our curriculum. After evaluating our new S2 course - we have to reduce the content. It is unlikely we will use the stem cell material in the same way. However, we will probably be able to include it in the new National 3 course which has stem cell [Learning Outcomes]. Cross dept. liaison has been difficult. In very busy school life, with little overlap of free time, meetings have been on an ad hoc basis. Grappling with busy schedules - it has been difficult.*

*Science Teacher*  
-----

# 4

With a little more brevity, this response also indicated good progress with the project.

*RME/science project: Genetics. Used envelop idea [from SSERC CPD] in RME and fact cards. Used 'my sisters keeper' DVD and created new materials. Worked with one science colleague - used a shared S2 class. Project completed. Very successful and assessment showed pupils had a deeper understanding of topics such as stem cell research and designer babies etc. Work will be sustained next year. Looking for more links that could be introduced.*

RME Teacher  
----

Other responses indicated less comprehensive or slower progress over the year. For example,

*Progress to date has been limited from a science point of view as it was felt that the new S1 and S2 courses had been developed to meet CfE. I have used the resources in my own class teaching. I have however noticed that next years draft school development plan has a section on cross-curricular activities so I am trying to meet with the PT of RPMS to see if we can take the 'stem cells' material further.*

Science Teacher  
----

*We have discussed ideas for interdisciplinary work. However, this has remained at the discussion stage. I have used the Lets Talk - designer babies resource in the RMPS Medical Ethics course with S4 pupils and found this helpful. We have been hampered by timetabling issues, downsizing of the RMPS department and restructuring of the curriculum. Courses which we initially targeted such as environmental issues are no longer running in RME. However, I believe that the link established with science will remain and it has been useful to hear what other schools have managed to do together across the departments.*

RME Teacher  
----

A number of responses detailed why they or their school had been unable to engage in joint working. Lack of time and/or competing demands were frequently mentioned in responses. Although the two following examples stressed a lack of time in their response they also indicated that they were still keen to develop the work at some point in the future.

*Not enough time/support. Most depts. are under a lot of pressure but it is something I wish to pursue.*

RME Teacher  
----

*We had planned to but with new courses being written this was put on the back burner due to time constraints. ... It is my hope this will happen.*

RME Teacher  
----

In addition to highlighting time constraints 2 other teachers also mentioned issues associated with timetabling.

*Due to the volume of work with the introduction of CfE, I have not had additional time to collaborate with RME. In addition, timetabling restraints and continually changing timetables have made it difficult to collaborate on joint projects. Unfortunately new science courses which have been added to the timetable have had to take priority.*

Science teacher  
----

*Timetabling meant no common classes. Time also did not allow for implementation of a project. Courses still very 'full up' and it is difficult to find 'extra' time from topics.*

Science Teacher  
----

Finally, 1 teacher indicated that resistance on the part of senior management, had prevented the development of joint RME/science work

## 4.34 CASE STUDY SCHOOLS

Case study reports detailing how the project developed in each school and what teachers and staff thought of the initiative are contained in the appendix. In each school we interviewed a number of involved staff and conducted focus group discussions with pupils who had experienced the SfM developments. In both schools we encountered enthusiastic staff and pupils who were keen to tell us their story. While the schools may have developed the initiative in different ways many of the comments made by staff and pupils were very similar.



#### 4.35 THE EXPERIENCE OF JOINT WORKING

In both schools staff were enthusiastic and positive about their experiences of joint working, how it could enhance the curricular experiences of pupils as well as contribute to their own professional development. For example, a Biology teacher in one of the schools remarked,

*I was really quite amazed at the fact there was so much linkage between RME and Biology in particular and I felt quite ignorant in some sense because I didn't realise obviously what the course of RME contained, things such as pollution and ethical issues such as stem cell, so I found that quite amazing and I think I've kind of adapted my teaching to try and involve things such as this and try to incorporate this and think about ethical issues when I am teaching biology because I don't want to be giving just my opinion to kids ... when it comes to the biology aspect I think it's important that pupils get a sense of what they think themselves instead of just being told facts and try to get them to form opinions.*

*Biology teacher*

----

While an RE teacher in the other school said,

*You have to actually know the scientific views on that as well, so for us we became far more knowledgeable about the topic as well and you have to be up-to-date on all the advances and anything new going on, so for us that was really good as well, so I think it was a win-win situation.*

*RE teacher*

----

Many of the staff and pupil interview comments focused on the benefits from the use of discussion and interaction regarded as a key teaching method in the materials and resources supplied by the *SfM* project. For example, one Biology teacher emphasised the novel aspects of pedagogy afforded by the *SfM* resources including discussion and group learning approaches and how it appeared to foster pupil thinking on decision-making. This allowed teachers to challenge pupils' assumptions and introduce a level of critical reflection to their teaching.

*It brought in their own decision-making processes and how to make those decisions and how to make informed decisions which is something that quite a lot of them at that age haven't really encountered before and they've got very entrenched views and it's all black and white and looking into grey areas was quite good.*

*Biology Teacher*

----

In another instance one of the schools organised and filmed a debate based on the BBC Question Time programme to discuss issues around Stem Cell research.

*The kids got to ask questions from the floor about some of the issues and the kids [on the panel] had to answer the questions according to the role that they had adopted, not necessarily their own views, but they had to argue that role and that was really good ... they really did do their research, so that was good and some of them have actually started just kind of going to that field now. It's sort of changed their whole outlook in many ways, so it was quite good.*

*RE Teacher*

----

Pupil opinions in both schools were similarly enthusiastic for the activities they experienced and its potential for their learning,

*Each person would maybe research one bit about religion and you teach each other and then it means that you're genuinely interested because it's not a teacher because it's just your pal or whatever. You're genuinely interested in what they've got to say and I think that makes you learn more.*

*Male pupil*

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*I think going into detail of it like helped a lot more in both of them because if we just learned it from RE on it's own then we might not have known as much as we knew because we are doing it in Biology as well.*

*Female pupil*

----

# 4

## 4.36 SFM RESOURCES

The *SfM* resources were well received and were generally regarded as high quality by the school staff involved. Additional support from the project for schools to develop their own resources was also recognised as helpful. Moreover, it was clear from staff responses that it would have been very difficult to take this work forward without the supplied resources. For example,

*As a school alone we could never have produced the materials that we produced. There's absolutely no way we would have had the opportunity to produce what we've produced ... gorgeous coloured pictures of children and stuff, so yes that's been invaluable absolutely. We're probably luckier than most.*

RE teacher

----

*Without that [time and resources provided] I don't really think it would have been a goer because there's just far too much to be done in schools just now and we've had HMI coming in especially to the department as well, so we've had stuff for HMI coming in and preparation for the new courses which are starting and have started and we've still got to evaluate all the stuff from last year at the same time, so without that that would have been probably one of the biggest issues ... when we went to [the] CPD [we] were just blown away by the quality of it and it then means that we have the resource and we don't have to photocopy each year and that again saves a lot of time and money.*

Biology teacher

----

There was one instance where a teacher voiced concern about the level of materials on Stem Cells, suggesting that it was too advanced for some of the S2 year group. However, this was not regarded as problematic and was treated as a learning opportunity for the pupils.

*... there was quite a bit of copying and pasting going on where they obviously didn't know what they were talking about when they were doing their presentations, but that was something I could pick up on and use that as a teaching point. They all found it really interesting. There was a lot of participation.*

Biology Teacher

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## 4.37 OVERCOMING THE DIFFICULTIES

While both of the case study schools had managed to develop an impressive programme of joint RME/science work in a relatively short period of time it had obviously required much hard work on the part of staff and a willingness to work through or around potential difficulties. It was evident from discussions with staff that in both schools their initial ideas and plans had been curtailed and adapted to some extent.

In both schools there were issues associated with the timetabling of science and RME which heavily influenced what developments were implemented. Even finding time for staff to meet and plan could be a challenge. For example,

*... trying to find times where we had a free period at the same time as science and they're doing everything on a rotation especially with the 2<sup>nd</sup> years and it's really, really difficult to get together with them you know, so that proved very difficult.*

RE Teacher

----

In both schools management support for the initiative was seen as important in at least allowing something of the work to progress.

*The Headteacher ... is the depute of science. She's been very, very supportive and she was probably the one that got us all together in the first place because she heard about the research and the head teacher is just marvellous ... My faculty head has been brilliant. He is just very, very supportive ... he's very much kind of driving and pushing as well to make sure that it's a success because he knows how much time has been invested in it.*

Biology teacher

----

#### 4.38 FUTURE DEVELOPMENTS

Staff in both schools were keen to see the work continue and develop but it was also the case that the work in both schools was subject to review. However, they were also aware that continuing the work would still require additional commitment on their part. In one of the schools the *SfM* material had been discussed by the local cluster group which had considered using some of the Stem Cell material for the added value unit, but there was also scope for further collaboration between RE and science in terms of topics such as the ethics of transplantation.

Pupils in both schools saw the interactive, group work and enquiry-based approaches as effective and suggested that such approaches should be used more in other science subjects such as Physics. Others saw the potential for Maths and English to embark on more collaborative teaching.

*Like Maths and English they're the most subjects we've got, like the most times a week and I can't concentrate on Maths because some teachers teach a different way than I can learn, whereas I learn more interactive than actually just out of text books and off the board and by sums, so it's harder to understand and I've to study more.*

*S2 male pupil*

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#### 4.39 CASE STUDY SCHOOL 1 - RESOURCE PACK

Three teachers in case study school 1 have, with the support of SSERC and the Project Leader, produced a resource/activity pack based on their experience of the *SfM* work aimed at fostering joint science/RME work around the topic of Stem Cells and referenced to a number of *CfE* outcomes. While the topic in this instance is Stem Cells' it is evident that the techniques could be applied to other 'controversial topics'.

#### 4.40 SUMMARY OF FINDINGS FROM THE FINAL SURVEY AND CASE STUDY SCHOOLS

The final survey had a much reduced response rate compared to the previous intermediate survey. However, those teachers who did respond provided a relatively full picture of what they had, or had not, managed to achieve in the period following the SSERC CPD.

The SSERC CPD had had an impact on teaching, practice and professional relationships among responding science and RME teachers and a majority of them indicated having become involved in joint science/RME work. Moreover, a majority also noted; having a wider network of colleagues, introducing the SSERC CPD materials to their teaching, being more able to implement *CfE* and taking on a significant role in science/RME collaboration at departmental and/or school level. A majority of the teachers also indicated that their enthusiasm for teaching had increased.

There was also some evidence to suggest that both science and RME teachers felt more confident in engaging with pupils in discussing ethical and moral issues following the CPD. Eight of the teachers provided vignettes of how the work had developed in their school. In a number of cases these vignettes indicated that time, workload and timetabling issues were the key barriers to developing joint science/RME work.

The case study schools give a strong indication of the benefits to staff and pupils which can follow from joint science/RME work. However, they also indicate that such developments require enthusiasm and commitment on the part of staff and firm support from management to help overcome some of the difficulties encountered.

# 5

## Discussion and conclusion

**The Searching for Meaning Project was an Action Research project, funded by the Esmée Fairbairn Foundation, which set out to explore how schools might better draw on science, philosophy and religious studies to help promote the values inherent in the different disciplines. The Project was based in Scotland and worked primarily with Scottish school teachers.**

The project addressed itself to the following 2 questions:

- Can science and RME teachers work together on themes in a way which will enhance pupils' understanding of science/religion issues?
- What are the resource and CPD needs of both groups and can we establish an effective model for interdisciplinary working?

This section of the report discusses the extent to which the project has answered these questions.

### **Can science and RME teachers work together on themes in a way which will enhance the pupils' understanding of science/religion issues?**

The short answer to this question is yes, science and RME teachers have, during the life of this project, demonstrably worked together on themes in a way which enhanced the pupils' understanding of issues concerning science and religion. This was most clearly seen in the case study schools where both staff and pupils talked about the benefits which had accrued to them as a result of joint Science RME working.

The baseline survey indicated that there was substantial initial enthusiasm among groups of science and RME teachers to develop joint science/RME working. Many of these teachers clearly recognised that there were 'gaps' in their knowledge and practice which could be, at least in part, addressed through closer links with their science and RME colleagues. None of the teachers who took part in the baseline survey and subsequent CPD had experienced any previous training or support for joint science/RME work. Moreover, these teachers also recognised that there were important benefits which could accrue to their pupils from developing closer working relationships between Science and RME.

Participants in the SSERC CPD were overwhelmingly positive about the experience. The content and materials demonstrated during the CPD events were clearly seen as relevant and suitable for use in developing joint working activities and programmes in schools. Teachers appeared to leave the CPD events full of ideas and increased enthusiasm for taking the work forward in their schools.

The final strands of data collection demonstrates that in a number of schools this enthusiasm was translated into a range of programmes and activities that were regarded as highly successful. However, it was also clear that other teachers encountered difficulties in trying to develop joint working in their schools. Time and other work commitments were often cited as impediments to implementation. Further, timetabling differences between RME and science in schools clearly impacted on the attempts to develop fully joint science/RME working. In a number of instances teachers had either made slow progress or had developed less ambitious programmes, often focused on one class and involving limited contact with their science/RME colleagues. However, many of these teachers also reported that their enthusiasm for the work remained intact despite the difficulties encountered.

In recent years Scottish schools have been charged with the development and implementation of *Curriculum for Excellence*. One of the key areas promoted by the new curriculum concerns increased interdisciplinary working to develop greater coherence across the curriculum. With this thought in mind there was a certain irony in the realisation that a few of the teachers who took part in the project were reporting little or no progress on joint science/RME working because of the demands on their time from the implementation of *CfE*.

**What are the resource and CPD needs of both groups and can we establish an effective model for interdisciplinary working?**

Overall, the resource and CPD requirements to initiate joint science/RME working in schools appear relatively small.

As mentioned previously, none of the teachers who took part in the baseline survey or any of those who subsequently became involved in the project has experienced CPD aimed at science and RME teachers working together. Therefore the Searching for Meaning project began, to some extent, with a blank canvas. However, the extensive CPD experience of SSERC and the project leader provided some initial guidance on the level and content of CPD that was felt to have been successful in previous CPD. Further, the project developed materials for curricular areas that had been identified in the baseline survey as suitable subjects for joint science/RME work.

In their feedback to the project leader and research team, teachers also indicated resource needs and priorities. In many cases they merely sought time to meet with their science/RME colleagues to plan and adapt materials. In a number of instances a small budget, provided by the project, was all that was required to support the printing of materials. In other instances teachers contacted the project leader seeking additional class sets of resources. In one or two instances teachers requested additional CPD aimed at developing the practical work. It was apparent from questionnaire comments and both case study schools that support from departmental/faculty heads as well as senior management was often vital in allowing science and RME staff members the time to meet together, plan the programme or activity and implement it in the classroom. Finally, difficulties in timetabling the two subjects to allow for greater articulation was an issue in a number of schools.

Reflecting on these comments and the evaluation findings in general it is clear that a small number of issues require addressing if schools are to effectively implement joint science/RME working.

These are:

- Identification of suitable areas/topics for collaboration.
- Development of relevant practical materials.
- Provision of joint CPD to introduce/highlight the developed materials (This could be an organisation such as SSERC).
- Commitment from school management to allow RME and science teachers the time to meet and develop joint working activities and programmes.
- Timetabling of subjects to allow for greater articulation and joint working.
- Small resource budget to allow for material production within the school.



# 6

## Appendix - Case study reports for school 1 and school 2

### CASE STUDY SCHOOL 1

This integrated secondary school is located in South West Scotland. It has a pupil roll of just over 1000 and 86 teachers(FTE). Twenty-five percent of pupils are registered for free school meals.

#### Interviewees

A teacher of Religious Education and a teacher of Biology were interviewed. A focus group was conducted with S2/3 pupils and focus group with 7 S2/3 pupils.

#### The nature of the Searching for Meaning in the school

Following the initial CPD sessions, the RE and Biology teacher trialled resources with 4 S2 classes that focused on aspects of stem cell research to consider moral issues and dilemmas. A scenario was developed where someone needed treatment from stem cell research and pupils debated their personal views as a child in the UK and contrasted this with the views of a child from another culture, discussing what the implications and impact might be for different religions. Pupils considered and debated the scientific evidence which had been presented in the resources. Teachers encouraged pupils to use the issues raised and the scientific evidence to reflect on their own views and also evaluate the various religious, philosophical and secular stances.

The participating teachers greatly valued the quality of the Searching for Meaning CPD and resources. Teachers were adamant that they themselves would not have had the time to develop the types of resources provided.

*As a school alone we could never have produced the materials that we produced. There's absolutely no way we would have had the opportunity to produce what we've produced ... gorgeous coloured pictures of children and stuff, so yes that's been invaluable absolutely. We're probably luckier than most.*

RE teacher

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*Without that [time and resources provided] I don't really think it would have been a goer because there's just far too much to be done in schools just now and we've had HMI coming in especially to the department as well, so we've had stuff for HMI coming in and preparation for*

*the new courses which are starting and have started and we've still got to evaluate all the stuff from last year at the same time, so without that that would have been probably one of the biggest issues ... when we went to [the] CPD [we] were just blown away by the quality of it and it then means that we have the resource and we don't have to photocopy each year and that again saves a lot of time and money.*

Biology teacher

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The Biology teacher reported that her thinking and approach to teaching Biology had changed as a result of the Searching for Meaning CPD session. In particular she had become aware of the cross-curricular links that could be made between her subject and RE.

*I was really quite amazed at the fact there was so much linkage between RME and biology in particular and I felt quite ignorant in some sense because I didn't realise obviously what the course of RME contained, things such as pollution and ethical issues such as stem cell, so I found that quite amazing and I think I've kind of adapted my teaching to try and involve things such as this and try to incorporate this and think about ethical issues when I am teaching biology because I don't want to be giving just my opinion to kids ... when it comes to the biology aspect I think it's important that pupils get a sense of what they think themselves instead of just being told facts and try to get them to form opinions.*

Biology teacher

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However, the teachers have also adapted the original Searching for Meaning resources. They drew on internet sources and carefully selected content that addressed cross-curricular themes including literacy and numeracy and health and wellbeing. The school is liaising with educational advisers including Education Scotland to ensure that it is addressing the relevant curriculum Experiences and Outcomes and also consulted an SQA assessor for Religious Education. The school plans to roll out the resources in RE and Biology a year after the pilot and with all S2 pupils. The school-developed resource has also been adapted for use in transition projects with P7 pupils.

*Now we've got them. There's so much you can do with them, absolutely fantastic. I had a set of Primary 7s that came up and all I did was give them the children's photos, that was part of the transition programme.*

RE teacher

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The project has been extended to include Home Economics, the Home Economics teacher regards the resources as a 'fantastic opportunity' and RE will feature in terms of teaching about various festival foods. The RE teacher commented that extending the interdisciplinary and cross curriculum teaching concept of the Searching for Meaning project to other subjects had to be done at a pace that was comfortable for all involved. As she said,

*I don't think it's right to enforce, to try and make it fit. I want it to be very natural and at the moment it is very natural the stuff that's in there and the children are making sense of it between science and religion which I think was important as well because when you do interdisciplinary stuff they don't often make the connection.*

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There was also some indication that the SfM resources and concepts have been seen by other schools across the local authority and there was some interest shown by teachers in other schools to explore their adoption.

### **Impact of the Searching for Meaning resources**

Regarding the impact of the SfM resources, teachers reported that they had fostered pupils' independent, evaluative and enquiry-based learning as well as enthused them to learn about the topics.

*It's also encouraged them to perhaps study and research in ways that they've not done before, so they're using books, they're using mobiles to gain access to the Internet, they're on my computer, there's just a variety asking each other, maybe asking someone in the class who actually practices that religion ... That's a fundamental area of curriculum for excellence that the child is in charge of their own learning and going at the pace that is kind of comfortable for them or that they're being pushed and they're being driven and they're given opportunities. I think because it's something that's very different I think it has excited the children.*

RE teacher

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In addition to motivating pupils the initiative was felt by teachers to have introduced more reflective discussion into Biology. This also appears to have led to considering the types of careers that are developing in Biology. As the teacher noted,

*I think the pupils really enjoyed it. It was something a bit different for them and learning about something that was at the forefront of science and the careers that you may decide you want to go into, so looking at the jobs involved in it and the different types of stem cells and some of the pupils have read the book "My Sister's Keeper" so it was really more of a discussion-led I found in science because they had lots of questions about it and obviously that to me is really important for curriculum for excellence is getting the pupils motivated and involved and trying to get them to come up with questions and it was really, really good.*

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Some of the pupils involved in the focus group believed that working together collectively and exploring each others' views promoted their learning about the topics, the ethics and values of others and for some; it challenged and even changed their views.

*We were all working in groups like we had to work together. It wasn't just our opinion, we had to take into consideration all the others' opinions.*

*It was nicer. It didn't bring us closer, but it was more of like a painting if you know what I mean working together and at the end we had to present it to the class and that was always better because I think you learn more if you see what other people think rather than just a teacher all the time because it's your peers obviously.*

*I wouldn't say it was wrong, but my opinion completely changed.*

*I think going into detail of it like helped a lot more in both of them because if we just learned it from RE on it's own then we might not have known as much as we knew because we are doing it in Biology as well.*

Female pupils

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# 6

*Once I was made more aware about it, it made me think more about all the different aspects of it rather than just what I knew.*

*Each person would maybe research one bit about religion and you teach each other and then it means that you're genuinely interested because it's not a teacher because it's just your pal or whatever. You're genuinely interested in what they've got to say and I think that makes you learn more.*

*Male pupils*

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Our teacher interviewees reported that other staff in the school felt that the pupils, who had been actively involved in both the Biology and RE aspects of the SfM programme, had improved their critical debating skills.

*Not so much during the discussion because there were pupils in the class who obviously weren't involved in RME, so they just thought it was a topical science project that we were doing, whereas the other pupils because they had the RME side they saw the relationship, or hopefully saw the relationship between the two.*

*Biology teacher*

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Teachers reported that the SfM resources had also excited and enthused those teachers involved in the initiative and raised awareness of how the two subjects could interconnect.

*It certainly excited us as teaching staff because it's something new and when it comes down to it if it excites us and you can put that passion on to the kids at the end of the day that's what they're there for, so if it excites us it's going to excite the kids and without that excitement there's nothing.*

*RE teacher*

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*I was really shocked to see how much RME and Biology linked together, so I've definitely taken that on board and consider different beliefs and different reactions and ethical issues that maybe involved in certain things, so yes from that point of view.*

*Biology teacher*

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The pupils' views generally concurred with this view and also indicated that their RE lessons had been more interesting because of the SfM approach. Pupils stated that, discussion, group-work, creative learning and enquiry aspects had made the experience more interesting and productive. One boy commented on how the discursive teaching approach not only improved his learning but also his rapport with the teacher. As he said,

*It was more relaxed in class so it made it better like you weren't so uptight about trying to get everything right straight away. You would just sort of take it in and I think it made you learn more because you were genuinely interested in what you were learning about ... The teacher would say to you that was quite good how you backed up your answer and you would feel happy about that.*

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However, one pupil did think that the lessons 'dragged on a bit'. There were also suggestions that more use of computers rather than books to conduct their research on the topics would have been welcome as would hearing from pupils who had different faith beliefs. Some pupils thought that other teachers in the school might not be so comfortable with the more creative learning style.

## **Factors influencing the success of the initiative**

The RE teacher stressed that the quality of the original SfM resources and the CPD session enthused her and her colleague to take their original idea, 'other people's faith and religion' and develop this to look at broader moral issues. The resources were seen to be very flexible and able to be used across a range of science and RE topics, not just stem cells. Teachers also noted that without the material support from SSERC the school would not have been able to fully afford the resources and materials or have had time to source them.

Teachers involved in the initiative at the school stressed the importance of having strong support from school management, including Departmental Heads and their colleagues. In particular, the role of the Headteacher had been key.



*The Headteacher ... is the depute of science. She's been very, very supportive and she was probably the one that got us all together in the first place because she heard about the research and the head teacher is just marvellous with anything that's raising the profile and anything that's benefiting the children and the children enjoyed it, so something went out in the newsletter this week about how the children felt about that style of learning ... My faculty head has been brilliant. He is just very, very supportive ... It's him that's encouraged that we do take it to LTS and we do kind of ... he's very much kind of driving and pushing as well to make sure that it's a success because he knows how much time has been invested in it.*

*The support of those people around us we couldn't have done it without the department heads and the PTs, even down to the head teacher who does just allow us to kind of get on with it and she's thrilled that this is kind of coming together.*

RE teacher

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The quality of communication, both face-to-face and via email, and a willingness to share ideas and learn from the respective disciplines was also seen by staff as an important factor in the success of the project.

*It was so important that we communicated in every level. I didn't understand the stem cell stuff. I needed to understand that. Nicola maybe didn't understand the nature of how we teach RE and the personal reflection and those elements, so that was really important.*

RE teacher

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Involved teachers stressed the importance of planning and organisation. Linked to this was ongoing reflection to review progress of the initiative thinking about how it could be improved. The physical proximity of science colleagues was cited by the RE teacher as a factor that helped to promote dialogue and collaboration on the initiative. Rapport and the quality of interpersonal relationships were also important with the collaborating science colleague having been a mentor for the RE teacher when she was a probationer at the school.

There have been challenges, however, with one teacher involved in developing the resources, an RE specialist, going on maternity leave. The availability of cover also limited the extent to which the original materials were piloted across the S2 year group. The pressures of time, other school priorities and having to ensure the developing materials fitted with the curriculum were also cited as issues.

*So trying to find the time to do this, spend the time getting the resources and getting it right I probably would have wanted more time. It has been as I said to you large chunks have been copied and pasted for adaptation, but we've got the bare bones. Other difficulties I think it's identifying how it's fitting in with curriculum for excellence ... of course I've got other courses running at the same time simultaneously that I'm having to prepare for in terms of curriculum for excellence, the National 4, the National 5 courses. I've got additional classes that are opting now because our children opt in 2<sup>nd</sup> Year and 3<sup>rd</sup> Year, so those courses have all got to be written as well, so just time I'm going to say and that's probably been the biggest.*

RE teacher

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The Biology and RE teachers reported that during discussion sessions not all of their colleagues in other subjects shared their enthusiasm for collaborative working as envisaged in the SfM programme.

One of the teachers highlighted the challenge of identifying their own biases and taking this into account when selecting new materials including video clips in order to develop the resources further.

# 6

## CASE STUDY SCHOOL 2

This is a state funded denominational secondary with and integrated special unit. The school has over 750 pupils on its roll and 64 teachers (FTE). Twenty four percent of pupils are registered for free school meals.

### Interviewees

One Religious Education teacher and one Biology teacher were interviewed. One focus group of six S2/3 pupils.

### The nature of the Searching for Meaning programme in the school

As part of the school's development of courses for CfE, the Biology teacher created a course for S2 pupils called 'the body unit' with part of this focusing on reproduction, reproductive therapies and innovative developments in medicine. Through this teacher's links with SSERC, the opportunity arose to become involved in piloting the SfM resources. The Biology teacher was particularly enthusiastic about working with the RE department and invited the PT RE to attend the CPD session. The appeal of obtaining quality, 'ready made' resources was an attraction. Subsequently these resources were described as 'superb, absolutely brilliant' and were readily able to be adapted to suit the school's requirements.

The Biology teacher developed two lesson plans with associated resources with other, non-science specialists in mind. However, not all of the intended teachers were able to do these lessons so not every S2 pupil had the same experience. Nevertheless, the Biology teacher thought that the pupils responded very positively to most of the content. There was also positive feedback from parents. The use of the resources coincided with an authority-wide development for all pupils to begin to build an e-portfolio which has seen aspects of students' PowerPoints from the initiative included.

For the S2 year group, the teachers had worked together on where stem cell research was currently, drawing on knowledge from the science department and developing ethical questions related to this field to stimulate pupils' thinking on these the possible choices. There was a small project at the end of the programme but the RE teacher believed that such issues could be covered in far more detail in the 6<sup>th</sup> year course.

However, the Biology teacher believed that there had been limited opportunity for the level of interdisciplinary working that was originally hoped for. Similarly, the RE teacher highlighted that a range of school timetabling issues had made it difficult to conduct truly collaborative programmes.

*It's fitting it in, but then trying to find times where we had a free period at the same time as science and they're doing everything on a rotation especially with the 2<sup>nd</sup> Years and it's really, really difficult to get together with them you know, so that proved very difficult.*

RE Teacher

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The Biology teacher did, however, have opportunities to discuss the materials with her RE colleague.

*I had a meeting with [the RE teacher] and she took me through some of the lessons that they did in 2<sup>nd</sup> year with the kids and how they teach it from an RE point of view and I hadn't encountered that before in my life. When I did RE we did the bible ... and you didn't discuss feelings or debates or moral issues, no discussion about that. It was very different for me and it was good to see that.*

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The RE department has piloted SfM resources with S5 and S6 year groups, however, Biology believed that there was insufficient time to develop a corresponding biology component from the resources for these year groups.

The teachers were able to engage Cardinal O'Brien to attend the school as part of the programme with a simulation of Question Time that pupils across the upper and lower year groups had researched, planned and role played. This event focused on ethical issues associated with reproductive medicine.

Teachers thought that this activity had demonstrated the wider impact of the *SfM* resource on pupils' skills, including planning, researching, drawing on critical reflection and debating.

*They were quite innovative and they developed ... that part of the course and they did a question time and they actually filmed it ... the kids got to ask questions from the floor about some of the issues and the kids had to answer the questions according to the role that they had adopted, not necessarily their own views, but they had to argue that role and that was really good ... they really did do their research, so that was good and some of them have actually started just kind of going to that field now. It's sort of changed their whole outlook in many ways, so it was quite good.*

RE Teacher

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### Impact of the Searching for Meaning resources

The Biology teacher reported that overall, participating pupils had responded positively. Through pupil feedback the teacher had heard that there were some issues associated with accessing research material using Google and on-line searching. The Biology teacher believed that the S2 pupils had enjoyed using the *SfM* resources and that it had addressed areas that most had little knowledge of it. Most pupils engaged well with the resources and were mature in their discussions. There was some concern from this teacher that some of the words and terminology regarding Stem Cells issues were too advanced for some of the S2 year group. However, this presented an opportunity for the teacher to identify and address needs.

*... there was quite a bit of copying and pasting going on where they obviously didn't know what they were talking about when they were doing their presentations, but that was something I could pick up on and use that as a teaching point. They all found it really interesting. There was a lot of participation.*

Biology Teacher

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The RE teacher believed that participating pupils had learnt much about the topics covered by the *SfM* resources as well as developing their critical skills which were transferable to other subjects and contexts.

*It was the fact that they learnt how to research and they learnt to listen to each other. I think that was the most important thing was that they learnt to listen to an argument and not just to pre-judge it. I think for kids who are so adamant that they're right I think that's a major point for them and I think it actually helped them in a lot of their other subjects because to be able to then start to become more open to other opinions and take that on board and go into other classes like that.*

RE teacher

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The Biology teacher emphasised the novel aspects of pedagogy afforded by the *SfM* resources including discussion and group learning approaches and it appeared to foster thinking on decision-making. This allowed teachers to challenge pupils' assumptions and introduce a level of critical reflection.

*It brought in their own decision-making processes and how to make those decisions and how to make informed decisions which is something that quite a lot of them at that age haven't really encountered before and they've got very entrenched views and it's all black and white and looking into grey areas was quite good.*

Biology Teacher

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The RE teacher believed that the S6 pupils, while not experiencing the intended joint RE/Biology programme had benefited from resources and concepts generated from the *SfM* programme. In some ways, the positive impacts teachers observed were similar to the evaluative and critical thinking gains experienced by the S2 pupils.

*I think [it was] the actual learning process for them. You know the actual having to go and research something and realising that yes there can be different opinions and you might agree with part of one opinion and part of another and for them they're used to 2 add 2 is 4 kind of thing and it's black and it's white and there's no in between and in our department we're really in for the devil's advocate kind of thing, so you're constantly challenging them ... but the research skills that they learnt from it as well and they were able to go "oh but so and so says this" and it was the actual idea that no you can't just say "I think this and I think that" and it's like "Well back it up?" and for a lot of them especially if they were going to university then it was skills that they really should be learning.*

RE teacher

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# 6

For the RE teacher, her involvement had also meant positive gains for her own professional development, particularly in terms of getting a better understanding of how science concepts are applied to areas covered by her subject. This then informed how she taught RE.

*For us it was really good because you're looking at it from a different viewpoint. Because you're saying to the pupils "right this is the scientist's view and this, that and the next thing" then for us we're having to go back and we're having to be open to it. It's not just saying "right we'll tell you the different sort of religious viewpoints on it". You have to actually know the scientific views on that as well, so for us we became far more knowledgeable about the topic as well and you have to be up-to-date on all the advances and anything new going on, so for us that was really good as well, so I think it was a win-win situation.*

RE teacher

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Pupils in the S2 focus group could recall doing 'designer baby' activities that stimulated debate on the ethics of this issue such as weighing the desirability of this for therapies without considering the needs of the 'designer child'. Pupils reported that they had learned a lot about Stem Cell therapies including the biological facts as well as an appreciation of the ethical issues involved. For some the concepts were quite challenging and new to them. Some pupils highlighted that they had used what they had learned to discuss the issues further at home with their parents. The debates about the ethical aspects of Biology were welcomed and pupils generally thought this had helped them to better understand the issues and other's point of view. Listening to group presentations that were based on pupils' own research was also valued and was seen as helping them learn.

*Yes because it was more interactive rather than just text book work. You can't concentrate if you're just doing the boring stuff.*

S2 male pupil

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Pupils saw the interactive, group work and enquiry-based approaches as effective and suggested the approach should be used more in other science subjects such as Physics. Indeed, one male S2 pupils reported that his Physics teacher encouraged this approach to learning. Others saw the potential for Maths and English to embark on more collaborative teaching.

*Like Maths and English they're the most subjects we've got, like the most times a week and I can't concentrate on Maths because some teachers teach a different way than I can learn, whereas I learn more interactive than actually just out of text books and off the board and by sums, so it's harder to understand and I've to study more.*

S2 male pupil

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However, one girl thought there were limits to adopting a more interactive learning approach.

*You can't make it too interactive because everybody will take it as a laugh and skive, but I think what we had in the stem cells one was good, the level was about the right amount of interactivity.*

S2 female pupil

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## **Factors influencing the success of the initiative**

Senior management were regarded as generally supportive of the initiative and had tried to address some of the timetable issues to allow RE and Biology classes to work together in such a way that the *SfM* resources could be used as intended. However, there were limits to how flexible the timetable and planning could be which meant that the original vision for the project had to be modified and limited, at least for the current planning cycle.

*... everybody was really like "Can we give you a hand, what do you need?" but you can't reinvent time, so as I say in the 6th year project they ended up being an RE baby in a way and the S2 was the one that was sort of shared between us although it wasn't something that we could collaborate on greatly because science did their bit and we tended to do our bit.*

RE Teacher

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The Biology teacher believed that she has been 'allowed to get on with' the initiative but did think that there were challenges from the school timetable.

*the pressures that there are with curriculum for excellence right now and the workload is phenomenal and this [SfM] was just a tiny little part of that and it took up a lot of time and just managing getting together that was hard and I really wanted to do it and I found it hard, so people that were maybe not quite so committed would have found that quite difficult as well.*

*Biology teacher*

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Time pressures from planning the wider curriculum to address the schools' CfE targets were seen as challenging given the level of workload for staff. In addition the physical location and distance between the respective departments also appeared to limit communication for collaboration. As the RE teacher explained:

*We're at completely different parts of the school, you know they're here and we're sort of way along there and three floors up ... so that is the hardest bit is actually meeting with each other and saying "What do you think about this?"*

However, despite such difficulties, the participating teachers believed the effort had been worthwhile.

*It was worth it because we managed to get a few good things going with the RE department and the RE department also managed to put together a little mini course for the 5<sup>th</sup> and 6<sup>th</sup> Years as well.*

*Biology Teacher*

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The RE teacher suggested that one way to address the time pressures would be to call on people's goodwill in order for twilight meetings to take place and put time into developing the resources. There was some indication that RE teachers were used to such a culture, for example

*For us a lot of the stuff [resources] that's out there isn't that good, so you're used to constantly making up your own stuff and it's just second nature that that's what you're constantly redoing especially when this is our faith and you're constantly making up new courses, so you just take that as being read, but you've always got people saying "oh a new course, that's a lot of work" and you're like "not really" depending on what you're doing, but you have to have the mindset of thinking right we're making up these new courses, this is what we're going to do and try and fit that in ... it's the benefits that you get from doing it that are so worthwhile, so hopefully each year just getting the chance to say "Right we did this last year, what can we do with it this year to add to it so that we make it easier for everybody?"*

*RE Teacher*

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#### **Future developments**

The Biology teacher is a member of the local authority cluster working group for Biology who are designing and planning content for the new national courses. She has shared the project science and RME resources with the group and all the teachers across the cluster group, so that they also have access to all resources electronically and can draw on them as they develop the new National 4 course.

The RE department plans to keep the course running and maintain the SfM resources for teaching 6<sup>th</sup> year pupils. It was also hoped that the S2 classes would be better able to fit in some of the SfM content in the forthcoming year because of efforts to explore ways of addressing the timetable issues. It appeared that RE teachers were trying to be as flexible as possible in their approach. As the RE teacher said,

*We'll say as long as it's not say Christmas or Lent we'll change whatever course we're doing at the time and just say "we'll fit in with you" because that's what it's about and just working together.*

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# 6

Reflecting on the initiative, teachers made some suggestions on refining the *SfM* resources.

*I would have liked to have seen if it was possible, just little packs or little folios, even electronic, it didn't matter, somewhere where the kids could access the information because websites change, stuff disappears, things are different, some of the questions didn't always match up with the information that I had available, so it would have been good to just have had a little package, electronic or hard, I wouldn't have minded, where the kids could have accessed the material without having to rely on Google to do it. That would have been really helpful.*

RE Teacher

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The Biology teacher also suggested that there was scope to make the resources even more 'relevant and pertinent to the work the teachers are having to do on the 'new Nationals', and stressed that there was significant demand for this from teachers.

Discussion in the local cluster group had considered using some of the stem cell material for the added value unit, but there was also scope for further collaboration between RE and science in terms of topics such as the ethics of transplantation.

Looking to the future, teachers were planning to review the course. One decision has been to reduce the amount of content which was seen as too much for the time available. Indeed, there was discussion over whether the course was best suited for the S2 year group because other curricular demands meant there would be too little time available to get through the material.







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