SifPT-e: Evaluation of

Science is for Parents Too

2016-2017

A report to the Centre for Lifelong Learning and the Wellcome Trust

August 2017

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Executive summary

The Centre for Lifelong Learning in York has been running *Science is for Parents Too* courses supporting parents with the learning of key stage 2 and key stage 3 science in previous academic years, and during the academic year 2016-2017 broadened their repertoire with a key stage 4 science course. At the same time, a pilot was run in regional centres around the country to investigate the feasibility of using the existing key stage 2 materials in different settings.

One centre for adult and family learning in a large urban area very successfully incorporated the key stage 2 SifPT course into their core provision, after some initial issues with recruitment and retention. The tutors in this centre, along with their centre leader, were committed to testing the course materials as intended by the original developers in York, tailoring it to their local area and the families that they thought would benefit from such provision. While their aims, and those of the schools who provide the facilities to run the courses, are largely related to engaging parents with their children's school's provision and curriculum, running courses that promise to be fun and enjoyable, they have found that many of the participants on their courses benefited from the informal language learning such courses provide, with the science courses being no different. Moreover, however, the participants genuinely seemed interested in learning science.

Another centre newly set up for family learning, in a secondary school in another urban area with similar deprivation levels as the first but a different demographic otherwise, saw their overarching aim as engaging parents with their children's science learning, with the ultimate aim to increase the children's attainment. They emphasised this for their secondary school students first and foremost, and did not stay true to the aims of running key stage 2 SifPT courses.

Parents are interested in supporting their children in any way they can, and SifPT courses can help them achieve that. Over the course of the year, they started talking to their children more about the science these children were learning at school, and grew in confidence in helping with homework. The enjoyment of the courses was universal in those who engaged fully, and there is evidence that their children benefited accordingly. One parent set up an after school science club not only for their own children, but for a larger group of neighbourhood children as well, replicating the science experiments they had engaged in on the course earlier in the day.

This report refers to variations of funding and organisational models, with suggestions for further experimentation.

Section 1 Background

Science is for Parents Too (SifPT) is a series of courses run by the University of York's Centre for Lifelong Learning (CLL). The project started in 2012 with a course for parents (and other interested adults) to teach them the science their children were learning in primary school (and perhaps up to Year 7, the first year of secondary school).

The original aims of the project were (Brown, 2015):

- To support the teaching of science in primary schools by re-engaging parents with science
- To help parents feel more confident when helping with homework and discussing science with their children

In 2012 Alex Brown[1] ran a course called *Simple Science* at the Centre for Lifelong Learning, supported by the Natural Environment Research Council. In early 2013 the first *Science is for Parents Too* course was conceived, funded by the Wellcome Trust. Recruitment was approached through the local press and radio, and local secondary schools, to target their feeder primary school clusters. 60 parents signed up, from 24 different primary schools.

The syllabus consisted of around a dozen topics chosen to provide a wide base of scientific knowledge, as well as fitting seamlessly with the national curriculum. In addition to being given presentations and demonstrations, which might lead to home experiments, the course participants enjoyed a trip to the Yorkshire Museum to support the classroom and home learning. The courses were very well received from the start (West (2014) and West (2015)).

In 2015 Alex added new aims to the project in order to give it new impetus:

- Expansion to Key Stage 3 science
- Develop a national strategy for the existing material
- Long term impact assessment of the course
- Expansion of the course online
- Expanding the brand into other subject areas (both science and non-science)

In the meantime, the aims of the courses had expanded to include: increasing the scientific knowledge of parents and encouraging them to share this learning with their family; creating a range of learning materials suitable for a range of abilities, which could be used in other locations; and raising the aspirations of parents by bringing them onto the university campus (West, 2015).

For the current academic year, 2016-2017, funding was obtained from the Wellcome Trust to expand the project into GCSE science, and to run an extensive pilot of the primary school-related courses in two other regions of the country, with two cohorts of parents of primary school children, to test the waters for national roll-out. This pilot was an extension of a small pilot in the year 2015-2016 in a more deprived area not far from York where family learning was well-established.

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[1] While confidentiality and anonymity are crucially important in this research, they were impossible to adhere to in the setting described – roles are too unique and recognisable. To avoid artificiality, I took the decision to use actual names of the people involved.

Section 2 Context of academic year 2016-2017

The funding proposal for SifPT for the academic year 2016-2017, with the subtitle 'Making a National Impact', was awarded to Mr Iain Barr (IB, Project Lead) and Dr Alex Brown (AB, Course Tutor).

Recruitment of other regional centres was underway in the Summer term of the academic year 2015-2016, with two centres, highly recommended by NIACE (National Institute of Adult Continuing Education), signing up to join the project. Tutors from one of the regional centres, who were not science teachers by background, visited York for a residential training period to familiarise themselves with the teaching materials, teaching methods and recommended experimental work. The other regional centre was based in a secondary school, and the tutors were qualified science teachers. Rather than them visiting York, Alex visited them to familiarise them with the materials and requirements.

The regional centres recruited course participants through their normal channels of recruitment for adult learning courses. The aim was to recruit parents (and perhaps grandparents or other carers) of primary school children, as the course materials to be used were based on primary school curriculum topics.

In the run-up to the GCSE-related course starting in York, Alex Brown left the project for pastures new, and Katherine Leech (KL), an experienced science teacher and outreach officer for the Department of Physics, was recruited on a part-time basis to continue the project at York. She took over the recruitment of participants and the development and running of the York courses, while Iain concentrated on the running of the project in the regional centres, with Katherine involved as much as possible.

Section 3 Objectives of SifPT-e

In order to evaluate the objectives of SifPT courses, a number of evaluation objectives were set at the start of project SifPT-e (developed from the funding proposal):

- Measure the trickle-down effect of science learning from parent to child
- Offer a similar model of (anonymous) testing to the adults who are engaging to gauge their own development
- Measure how increased parental involvement has impacted upon A-Level choices
- Measure whether parents now understand the science taught across the curriculum
- Adopt a longitudinal approach to the evaluation process, by considering previous years' evaluations as the backdrop to this year's project, to determine whether this initiative has successfully built upon the work to date
- Capture the practitioner experience of the tutors in the regional centres at a final 'lessons learned' event to determine what has worked successfully and where future challenges lie, in order to evaluate the efficacy of actual roll-out set against the original plan
- Evaluate the fidelity of delivery to determine the true portability of the project for longer-term roll-out
- Set key performance indicators which would determine successful national implementation

These objectives can be reformulated into the following research questions:

1. What are the effects of SifPT courses on adults taking these courses?
2. What are the effects on children in families where adults are taking SifPT courses?
3. How do SifPT courses perform in regional centres other than the one where the courses were developed (i.e. York)?
4. How do tutors in the regional centres see the successes and failures of SifPT in their centre?
5. What can be said about success criteria for national implementation of SifPT courses?

Section 4 Outline of the design of the project

From the funding proposal the following methodologies were suggested:

- Children will be asked to complete a shore pre- and post-project quiz to benchmark their attitudes to science and science literacy
- Control groups from local schools will be utilised to provide a benchmark for non-engagement
- Pre- and post-testing the adults (anonymously) to gauge their development.

These methods were based on earlier evaluation projects run by Sarah West from the Stockholm Environment Institute (West, 2014; West, 2015). While initially this model was adhered to, some changes had to be made for logistical and organisational reasons.

The attitude questionnaire for the children as used by West was developed from material by Pell and Jarvis (2001). For the current project, variations of this questionnaire were used as appropriate for the various phases of the courses, and open-ended questions were added. The questionnaire for parents was similarly developed from earlier materials by West, with adaptations made so that adult and child questions on attitude can be matched. The questionnaires were developed on-line in Qualtrics (see https://www.york.ac.uk/it-services/services/qualtrics/), the University of York's preferred platform, and made available on paper where requested.

As the previous evaluation projects have already shown, children whose parents take part in SifPT courses have a more positive attitude towards science compared to their peers whose parents have not had such an experience. Certainly their attitude and knowledge changes for the better over the course of their parents' participation in the courses. In the current project, the group of participant children in York was extremely diverse in age, and the majority of children of participant parents in regional centre 1 were so young that very few participated in the research themselves. In addition, recruitment of control groups at the beginning of the project did not go to plan so comparisons with children whose parents have had no input from SifPT had to be abandoned in this project. It would have been impractical, at best, to recruit appropriate control groups to make comparisons with the diverse participant groups feasible.

There was no budget for travel or other support for the evaluation aspect of the project. In-depth research with the adult participants in the regional centres was therefore not practical. Online questionnaire research with participants (and their children, where feasible) was complemented with the study of materials exchanged between participants, tutors and course leaders, and in-depth interviews with the course tutors, both at the beginning and the end of the course period. In addition, course tutors and leaders in York were interviewed towards the end of the project.

The adult course participants in York were invited to take part in an interview to get a more in-depth understanding of their reasons for enrolling on the course, their expectations and objectives, and the outcomes as they saw them.

The questionnaires can be found in Appendices A-D. The interview schedules can be found in Appendices E-I.

Section 5 Findings – recruitment and retention

Several levels of recruitment are at play in the SifPT and SifPT-e projects:

1. Course tutor(s) in York
2. Regional centres and their course tutors
3. Participants to the courses
4. Participants in the research, including control groups

In the event, the change of the lead tutor in York came at a crucial moment in the project and may have had some impact on the recruitment at levels 2, 3 and 4. All seemed well with regional centre 2 when Alex visited, but the centre did not continue on the path initially taken. The lack of feedback towards York meant that by the time Katherine took over, the problems had already started. It is impossible to establish whether the slight discontinuity in the staffing in York had anything to do with this or that Alex would have been able to intervene if he had stayed in post (see also section 8). Recruiting participants for the courses in York was approached in two stages because the initial recruitment drive from parents who had participated in earlier courses did not lead to sufficient participants. The second phase of recruitment coincided with the change of staffing in York and ran close to the Christmas holidays. Despite this, overall numbers of participants in the courses were similar to those in earlier years. All participants in the courses, in all the regions, were eligible to participate in the research, and all were invited by the course tutor leading the sessions. The potential for control groups was discussed with the course tutors involved, but none were recruited for reasons outlined in section 4. Recruitment of regional centre 3, and the course tutor who would lead the sessions, resulted from the extensive network of contacts Katherine has because of her outreach activities.

Regional centre 1, which sent its tutors to York for a residential training course in the Summer of 2016, was committed from the start and made every effort to run the SifPT courses in the way they had been designed and proposed. The three tutors and their centre leader worked together to set up and plan for the courses, and worked on the recruitment of participants to the courses along the lines of the normal recruitment processes for their other adult learning courses. They were worried about recruiting parents for a 20-week course, and pleasantly surprised that it turned out to be feasible in their setting, with the participants eager to take part in the second half of the course, even when it was relocated to a different school (see section 8). Recruitment of participants to the SifPT-e research project, including control groups, was postponed (and recruitment of control groups later abandoned – see section 4). Communication about the courses and participant recruitment at level 3 was very effective, with regular updates between the lead tutor and Iain at CLL, and with Katherine once she was in post.

Regional centre 2, where the courses were to be run by qualified science teachers, signed up slightly later but seemed to have their recruitment of course participants in order, and even offered to find control group children from within their schools which matched the participants' children on age, gender and socio-economic status (see section 8). After a few months, it turned out that so many staff at regional centre 2 had changed since they had signed up, that the original plans had been abandoned and the courses that were run showed scant resemblance to what was intended to be run as part of SifPT. Communication with York was sparse. The tutors had used scientific topics which were much more suited to

11-14-year-olds than primary school children, and had included the children themselves in the courses, therefore running it more like a key stage 3 revision course rather than a course for parents to familiarise themselves with the primary school curriculum (see also section 8). The collaboration with regional centre 2 had to be abandoned half-way through the academic year.

With funding provided for courses to be run in two regional centres, CLL renewed efforts to recruit in another area. A centre not far from York was found eager to try a short version of the SifPT course in their area, for which another tutor was recruited from The University of York who took on this role in regional centre 3 in Spring 2017.

Section 6 Findings – data collection

Course tutors were responsible for data collection, as direct contact between the participants and the researcher was generally not possible. The tutors provided their participants with either a URL link to an online version of the questionnaire, or with a paper version of the questionnaire. These could be completed during course sessions or in participants' own time. Course tutors, both in York and the regional centres, encouraged their participants to complete the pre-project questionnaire as early as possible in the course, and the post-project feedback questionnaire as soon as possible after the course was finished. Similarly, course participants were provided with questionnaires (online or in paper form) for their children of primary and secondary school age. Participation in the questionnaire survey was voluntary for all participants, both adults and children, and they were each asked to sign their name on the questionnaire by way of consent for their data to be used in anonymous form.

While the move from paper questionnaires (as used in earlier years) to online forms of surveying was seen as laudable in these modern times, the practicalities of the settings, with recruitment and retention, multiple tutors in multiple venues, and other logistics factors playing a role, resulted in data collection that was not as extensive and successful as was hoped. In summary: "we'd done it on paper before, and [the researcher] tried to move things to an online version, and it's not, sadly, worked" (IB). More extensively argued, also relating to the context of SifPT being developed into an online course altogether as one of the options for national roll-out:

> "we definitely need to look back on it. […] whether it could be something that's online, but again it's whether you're going to reach the right people through doing that because it would be people who are already digitally engaged, and I think from what you're seeing on the evaluation, if the people aren't even filling in the pre-course questionnaires, what's the likelihood of getting them on a FutureLearn MOOC? There's an assumed bit of learning in terms of getting them to that point as well" (IB)

The questionnaires varied slightly in content. The most comprehensive forms of the pre-project and post-project questionnaires, for adults and children, are included in appendices A-D. As pre-project questionnaires were not always completed, an attempt was made in the post-project questionnaires to collect data about possible changes. Where appropriate, these answers were compared to data collected at the start of the course.

Over the course of the project, 89 course participants took part in the survey research, namely 69 adults and 20 children. As names were entered in free format and some did not enter their name at all, it has not always been possible to ascertain whether similar names in fact refer to the same person, so the actual number of adult participants may be slightly lower than 69. Similarly, it has not been possible to ascertain which children were in the care of which adult. Some information about the sample is shown in Table 1.

Region	No participants	No adults	No children
York	44	31	13
Region 1	33	28	5
Region 2	3	3	
Region 3	8	7	1
Region unknown	1		1

Table 1 Sample characteristics

The data from region 2 will not be used in the analysis.

Gender data were not collected, but judging by the names there was a mix of male and female, both in the adult and the child participant sample. The adult participant sample comprised parents and grandparents (but never parents and grandparents from the same family). Children were invited to give their age in years and months, which ranged from 7 to 15 years, with some being siblings, and not all siblings from one family necessarily completing the questionnaires at the same time. Eight of them were in primary, and 11 in secondary school education.

In addition to the questionnaire data collection, interviews took place with

- The three course tutors in regional centre 1, individually at the start of the project and as a focus group at the end of the project;
- The lead tutor in regional centre 2, over the telephone, at the start of the project;
- The project lead in York (Mr Iain Barr), towards the end of the project;
- The course tutor in York (Dr Katherine Leech), towards the end of the project;
- The majority of the adult participants in the York course, at the end of the project; all those who completed the course were invited for interview, and 15 of them responded.

Information from a telephone conversation between Katherine and one of the course tutors in regional centre 2 was relayed to the researcher during the interview with Katherine towards the end of the project.

Section 7 Quantitative data

Introduction

The structure of the quantitative data and the sub-samples of participants are such that in-depth rigorous statistical analysis is not appropriate. With 69 adults and 20 children completing the questionnaires, some at the beginning of the course, some at the end, and only some fully completing questionnaires at both time points, and sub-samples of adults in each of the regional centres being rather small in number, it is more sensible to look at the quantitative data in light of earlier evaluations by West. Where consonance or dissonance with those evaluations seems particularly pronounced, those issues will be highlighted here.

Sample

In York, of the 31 adults 28 provided pre-course registration information, 22 completed the questionnaire at the start of the course, and 19 completed the questionnaire at the end of the course (either at the celebration event which took place in the half term break just before the final two course weeks, or in the final weeks); 14 of them completed all three. Three of the York course participants were grandparents to school age children.

Regarding the 13 children from York, four provided data at both the start and end of the course their (grand)parent was on, two only at the beginning, and seven just at the end. For eight of them it is clear which (grand)parent was attending the course.

In regional centre 1, 18 adults completed the questionnaire in December or January, and a further ten completed it in early May. There are no overlapping names among these 28 and as regional centre 1 was starting new courses at different times and re-recruiting for a course when they had to move to a different venue, these data should all be treated as related to 'starting the course'. The five children in regional centre 1, who completed their questionnaires in early May, cannot be matched to any of the adults. The data from children in this region were particularly sparse because many of the adults on the courses have children who are younger than the age range the course was designed to cater for. None of the adult or child participants completed the questionnaire at the end of the project, but regional centre 1 provided some access to their own feedback systems via email.

Data from regional centre 2 – three adults completed at the beginning – are not included in the analysis.

In region 3, seven adults and one child (which can be matched to one of the adults by name) completed the questionnaire at the beginning or the short course the adults were following. There is one set of (course-start) data from a child for which the region is unknown, possibly regional centre 3.

Results

Responses from York participants who provided the most comprehensive set of data are presented in appendix J. From these it is clear that:

- The adults were generally confident that where there has been a change in their attitude towards each of the statements, it is a change for the better: almost all scored 4 or 5 (i.e. partly or strongly agree, respectively) at the end of the course, and the majority felt this represented an increase in their score.

- The adults already felt they had a reasonable scientific literacy – many felt comfortable with basic scientific ideas and the science taught to their (grand)children, and the level of interaction with science programmes on TV and science in the news was generally better than neutral.
- The adults improved most from 'pre' to 'post' on the statements where confidence talking about science and helping with homework were concerned, where almost all self-reported an increase, matching the change in the separate responses at the different time points as well.
- The children in this very small sample were generally positively disposed towards science, not finding it too difficult nor finding they have to do too much of it at school. Respondent 12005, who is the only primary school student of the four in this sample, seemed more changeable in attitude to science at school and as a possible career – the other three, at secondary school, more settled in their ideas about careers and the likelihood of science playing a part in those. All four wholeheartedly agreed that 'science is fun'.

In the context of the responses of the whole sample, looking at responses either at the beginning or at the end of the course and not necessarily looking for significant changes over time, we can see that:

- Adults attending the courses in York reported they had become more confident that they understand the science their children are learning in school, although the change in the numbers from beginning to end was not significant. In the post-project questionnaire none of the adults disagreed any longer that they understand it, and the vast majority reported a positive change. With respect to their understanding of basic science in general, the picture was even more positive, with an almost significant change between pre- and post-project for the 15 adults who responded in both phases. The self-reported change was similarly encouraging (see Figure 1).
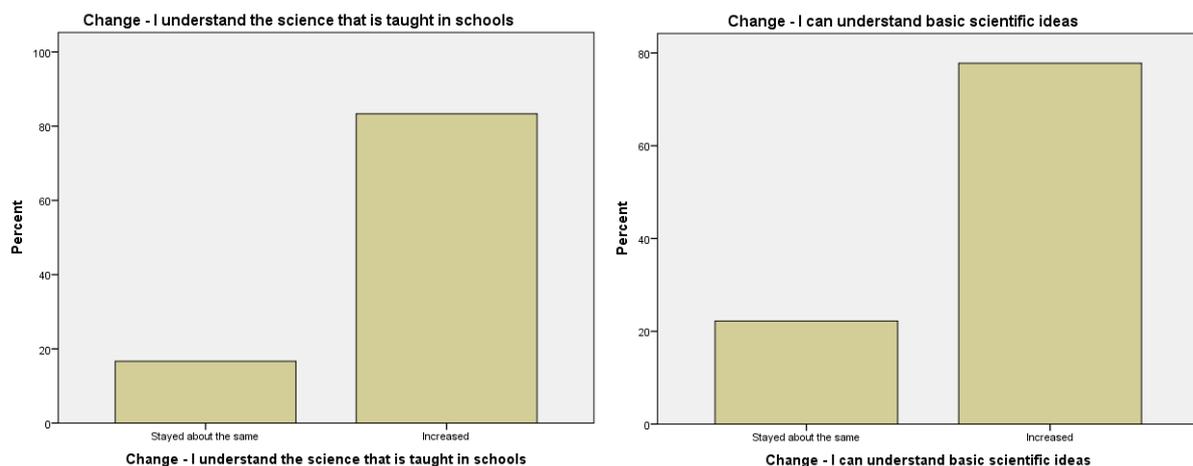

Figure 1. Self-reported change in adult participants regarding the change in their understanding of school science and basic scientific ideas in general

- Both adults and children were generally quite interested in watching science programmes on television, and this remained largely constant over the course of the project.

- When asked whether they can talk about science confidently, three of the 57 adults strongly disagreed at the start of the course. The one who also completed the questionnaire at the end of the course reported an increase in confidence, now somewhat agreeing they can talk about science confidently. In the adults who completed in both phases, the change from pre- to post- is significantly positive, and only one still disagreed slightly that they can talk with confidence (this person did not complete the pre-project questionnaire).
- The confidence with helping (grand)children with homework showed a significant positive change in those completing the questionnaire at both time points, matched by an increase in self-reported change. At the same time, general levels of self-confidence did not change significantly, again matched by self-reported confidence levels not having altered.
- In the post-project questionnaire, the children were asked whether they had noticed a change in the adult attending the course. Five of them reported that they had noticed a change, with another five unsure. Their qualitative responses are reported in section 8.
- The adults were asked whether they read 'science news stories', while the children were asked whether they read 'science stories'. The majority of children liked to read science stories, but did not report much of a change. The majority of adults similarly reported a liking for reading news stories about science, and they were split fairly evenly into groups of those who reported an increase and those who did not change.
- The responses to the attitudinal section of the children's questionnaire were largely (or even very) positive, on the whole, similar to what West found in earlier years. The sample was small, but many would consider becoming a scientist, and agreed that scientists make people's lives better. They seemed to like their science lessons, and to like talking to the adult(s) in their family about the science they were learning at school. Where probed, they reported that these views had changed very little over the course of the project. In response to questions about 'too much science in school', or 'too much work in science' or science being 'too difficult', they were also fairly consistent in their disagreement with those statements, again not reporting any particular changes.
- Where children were asked about the adults who had been on the courses, the children were particularly positive that changes had happened in these adults' willingness and eagerness to talk about science, and to help them with their homework. This sample is particularly small (only eight or nine), and the responses were almost even in relation to the adults having increased their knowledge of science or not. With respect to the adults' knowledge of the curriculum the children were supposed to be learning in school, however, three-quarters reported not to have noticed a change over the course of the project. The frequency of visits to science-related museums and other places where they could learn about science, also appeared not to have changed.

Regional centre 1 provided an overview of the feedback they had collected through their own systems, which, while the sample is limited to eight adults from one of their courses, is overwhelmingly positive. All eight claimed the course had changed their life for the better, through improved skills and knowledge, confidence, social development, and being able to

help family members, not to mention improved chances of obtaining a job. The course itself, including the tutor, received 'excellent' or 'good' feedback from all participants on all but one of the statements – only one participant felt that the course 'needs improvement' compared to what they expected.

Section 8 Qualitative data

Introduction

The qualitative data stem from two different sources:

- Answers to open-ended questions in the questionnaire, from both adult course participants and children;
- Interviews with adult course participants, course tutors and project lead.

From an overview of the words used by participants – adults and children together – in the answers to open-ended questions in the questionnaire (see Figure 2), it is clear that the adults were hoping to be able to help the children, and that science is seen as interesting.

Figure 2. Word cloud related to words used by adult and child participants in answers to open-ended questions in the pre-project questionnaire

Sample

Fifteen adult course participants were interviewed at the end of their course. All of them provided pre-course registration information about how they found out about the course and what their reasons were for joining. These aspects were probed further in interview, along with their own educational background. Eleven of them completed the course and took part in (almost) all of the sessions; nine of these completed both phases of the questionnaire, with two only completing it at the end. For the other four where course completion data are unavailable, two completed the questionnaire at the beginning, with the other two only providing pre-course registration information.

The three course tutors from regional centre 1 were interviewed individually when they visited York for their pre-course training, and again (but together as a focus group) towards the end of the project when they visited York again for a final 'lessons learned' event with the project lead and the course tutors from York and regional centre 3. The course lead from regional centre 2 was interviewed by telephone early on in the project, before the courses were due to start there. Katherine provided information about the issues with

regional centre 2 from a telephone conversation she had held with one of the course tutors from regional centre 2 who had been involved in the delivery in the initial weeks, not long before the original tutors left the project. Katherine was interviewed towards the end of the project. Iain was also interviewed towards the end of the project, to get an update on the organisational issues surrounding the courses in York and the regional centres. The course tutor for regional centre 3 was present at the final 'lessons learned' event but had very little to add as the course had only just started at that point.

Results – regional centre 1

The course tutors from regional centre 1, as interviewed at the beginning and end of the project (denoted here with abbreviations 'pre-int' and 'post-int' for 'pre-project interview' and 'post-project interview', respectively), were not aware of how their centre had been recruited. Tutor1 (post-int) said: "I certainly assumed that we were approached by the university […], potentially along with a number of other family learning providers, but I don't think we applied", and tutors 2 and 3 were adamant that their centre manager had made the decision that it would be good to participate – "[they] said [they were] interested in science" (tutor 2, post-int). As it happens, their centre, along with regional centre 2, had been recommended to York's Centre for Lifelong Learning by their local branches of NIACE. As the CLL lead explained:

> "We have close links with NIACE […], they would nominate two regional teams, anywhere across the country, that they felt would do good jobs on this, who had a track record in delivering community interventions, working with parents, all those kind of things […]. [They] recommended [regional centre 1]." (IB)

As the intention for the roll-out pilot was to run 20-week courses with two separate cohorts throughout the academic year 2016-2017, at least two but ideally three course tutors were to be involved, which was achieved successfully in regional centre 1. The centre was fully established as an Adult and Family Learning centre, with major involvement in primary schools and Sure Start Children's Centres throughout their large urban area. The majority of their courses were run in primary schools, where local outreach workers would be heavily involved in recruitment of parents to the courses on offer, some more successfully than others, and, according to the tutors, sometimes predictably so:

> "We do get that with outreach workers, don't we, you get some in some places and you know that you'll get a good turn-out and you might get an outreach worker somewhere else who doesn't do as much work on it" (tutor3, post-int).

Between them, the three course tutors had run a wide variety of courses in the past, from literacy and phonics, to sculpture, animation and other digital skills, arts and crafts, and story-telling. One of them had trained (but not worked) as a primary school teacher before going into family and community learning, and the other two had been art teachers in various adult learning settings. None of them had any experience teaching science per se, and they did not feel particularly confident about the science they were due to teach, as one said: "Theoretical, I find it quite hard. It's not that I'm not interested, but I don't find it that easy to understand, either" (tutor3, pre-int). The training sessions in York made a large difference to this, and their collaboration in the planning phase certainly helped, as they said: "definitely useful at the start" (tutor2, post-int), and "I think it needed at least three of us" (tutor1, post-int). In addition, "we used the books a lot, I used the book as a resource, an awful lot, for information. So for me the books that we were given were really useful"

(tutor3, post-int), to which tutor1 (post-int) added: "it was a good guide as to […] the topics themselves, I suppose". When asked whether they felt like science teachers now they had one year of experience teaching SifPT, one was confident:

> "I've done a bit of science in the past, with my own work and things. I've always been interested in science anyway, like I spoke to you last time. So it's quite good. Because it's not that far removed from having a craft lesson in a way. It's a lot of practical hands-on […]. It works, for me" (tutor2, post-int)

The others were not as settled in their roles as that, one referring to their own area of expertise:

> "For me it was totally different. Because I teach literacy and phonics, so it's definitely nothing craft-based that I do, and because I've not really had any kind of science background, so the night before any lesson, I was reading, just to make sure I was that one step ahead I suppose, but that's a challenge, it's always good to challenge yourself, I suppose" (tutor1, post-int)

To this, tutor3 (post-int) added: "and I am an arts and crafts person, but my art and craft hasn't helped me with the science". They were prepared to face the challenges and share their expertise and resources appropriately, and acknowledged that the second course they ran, slightly later in the year, had already been a much better experience, "yes, doing it the second time around" (tutor3, post-int), and "we just got to know a bit more about that subject in that time, so…" (tutor2, post-int).

Many of the families in their area had English as an additional language, and English language courses were the most popular, with long waiting lists. Science courses had never been in their repertoire before, but "things are always shifting and changing now, the manager wants us to be doing some new things at the moment" (tutor3, post-int) and SifPT could fit the bill. At the start of the project, the course tutors were apprehensive about recruitment and retention, with the length of the courses (20 weeks) the major concern:

> "one of the concerns – slight concerns – that I've got is the fact that it's so long, far longer than what we normally deliver so I just think retention of parents might be something we'll have to work on and we'll have to sell the course but we will cross that bridge" (tutor1, pre-int)

The vast majority of their courses were ten weeks, and "sometimes even that is too long for some of our groups, isn't it?" (tutor1, post-int), so "some of them are more like six weeks" (tutor2, post-int). As can be seen from the pre-int quote, the concern was there, but there was also confidence that they would find ways to succeed. Another major worry was the interest of potential learners in a science course for science's sake, with the expectation that some of them would register in the hope to pick up some English along the way and perhaps graduate onto EAL courses, for which they have evidence from other courses, verbalised thus:

> "ESOL is a big thing in education in [regional centre 1] generally, so because of the waiting lists, we find a lot of ESOL parents will attend my literacy courses […] What these learners yearn is, they will grasp any opportunity that they think will somehow improve their English, and any taught course will allow them to improve their English, because a lot of my colleagues, who deliver the confidence building courses,

the parenting courses, huge amounts of ESOL learners on those courses" (tutor1, pre-int)

As it transpired, the parents turned out to be much more keen on the science itself than the tutors expected, and the 20-week course worked out very well, even in the situation where a new course location had to be found for the second half, resulting in the following exchange between the tutors:

> "It says a lot for you guys [tutor2 and tutor3], the fact that a) it has been pretty much 20 weeks, and b) you've had to move venue, so parents have…" (tutor1, post-int)

> "…they followed us! We were surprised, weren't we?" (tutor2, post-int)

> "And they're still there, for [tutor3]'s story-telling course, so it said a lot, I think, for you guys" (tutor1, post-int)

The courses have been so successful that regional centre 1 is going to continue to run them, although they are most likely going to be run in ten-week modules, for some very good reasons. "We pull down funding through bums on seats, and if we've got a certain gang of learners for 20 weeks, we could have had double the funding if we go somewhere else and do another course" (tutor1, post-int), so two 10-week courses attract double the funding of one 20-week course, that is, if different cohorts attend the courses. In addition, the schools where the courses are to be run tend to plan their facilities management on a termly basis and are not keen to block book their school hall, for example, for a stretch as long as 20 weeks: "the schools aren't used to having 20-week courses. They're usually half that" (tutor2, post-int), because "they're used to what we normally deliver" (tutor1, post-int).

Recruitment of participants was not equally smooth in every area, but plenty of lessons were learnt during this year. Offering one-off taster workshops to schools, of which one of the course tutors was going to run another half dozen or so before the end of the Summer term 2017, was seen as a very good way to give schools and parents a taster session of what could be done in a ten-week course, and many schools duly signed up for a full course at their school after the Summer holiday. The fact that the courses are free for both the schools and the parents, barring providing the room facilities and perhaps some consumables resources, was an excellent lubricant. Some schools were keen to support the tutors in any way they could:

> "Some of the schools actually who we've approached to do workshops and things, have bought all the stuff in, or they've got things in, like […] we're doing a lung thing, and [the school contact] said "Oh, we've got like a model there, we can use" [and] we've got another one with the planets, there's some things that the schools have, already, that key into their key stage 2 anyway" (tutor2, post-int)

The SifPT courses slotted into the provision of regional centre 1 in such a positive way that they now propose to keep it in their repertoire for the foreseeable future. That this means that the course tutors will perhaps not be able to run certain other courses as they will be running SifPT courses, was not seen as a problem:

> "We often just respond to what's requested anyway. And we are a small team, so the partners […] are aware of that, and they may just have to wait their turn slightly, if it is an animation course and [tutor2] is fully booked, for example" (tutor1, post-int)

Rather, the science course was going to enrich the overall provision and had given the centre a "shot in the arm" (tutor1, post-int). The courses are due to continue to run with the same kind of initial publicity as during academic year 2016-2017, with explicit mention of the link with the University of York, which was well received by course participants. The tutors tended to make the link explicit whenever appropriate, and "when we came to give certificates out, as well, because it had York University [sic; tutor1 interjected here with "University of York"], sorry, yes, on there as well, it was like "Oh, right, it's not just a City Council kind of certificate"" (tutor2, post-int).

The course tutors mentioned particular impact with one of their participant parents who had set up an after school science club for local children, after initially only running it for their own children. The neighbourhood children got wind of it and were included later on. The parent would re-run the experiments performed in the adult course later in the day at home with the children. As mentioned in one of the reports from the centre:

> "After a few weeks attending the class, [participant] started trying out some of the science experiments at home with [the] children. […] The following week [participant] would return full of enthusiasm, telling us that the children worked together with [participant] and loved it. More recently [participant] told us that [the] neighbour had been asking about 'Science Club', so [participant] now has the neighbour's children round each Wednesday afternoon to teach them all about science too".

And the certificates that the regional centre provided for the adult participants were emulated ("Yeah, I made some certificates with a star in the middle saying that they'd completed the course, at home" (tutor2, post-int)), and "[they] had a little graduation ceremony with the kids at home" (tutor3, post-int).

The tutors were very appreciative of the collaboration with York, exemplified by the following exchanges:

> "Setting up courses at certain times was difficult […], we had little stumbling blocks where we had to move venue entirely for [area1] group, so there was a bit of a break, a bit of a lull of nearly a month" (tutor1, post-int)

> "We had one at [area2] at the start which didn't recruit, really" (tutor2, post-int)

> "[area3], that flopped, [area4] flopped, but Iain was brilliant in terms of everything, just bouncing ideas, just really checking whether we were doing things acceptably, and just checking are we doing OK, are we doing alright, is what we're doing acceptable by the project" (tutor1, post-int)

And

> "During those periods we were bouncing ideas off Iain, we would go "we've set up this other course, we've set up this workshop" […] and within an hour he'd send me all the publicity we'd ever need, so he was absolutely brilliant." (tutor1, post-int)

The CLL lead was equally positive about the collaboration, mentioning these aspects in particular:

> "[They've] been absolutely fantastic. [They've] been proactive, when [they've] seen problems arising, [they've] been in contact to say "how do we resolve this? How do

we help with recruitment on this? What about these activities, can we tie those in with this?" So if you get partners like [regional centre 1], fantastic" (IB)

The post-course evaluation materials collected for in-house purposes in regional centre 1 showed the course had considerable impact on the participants. Many mentioned enjoyment, but there were some more specific comments that the "[tutors] are great communicators to all people, ages, and styles and are really suited to teach", adding "it's not my first and probably not my last course". Another added: "I loved experimenting in the class on varied topics. The tutors made things easier. I love science now. I would like this course to continue". The impact on participants' children also came to the fore, when one said, for example: "This course has had an impact on my life very much, because I now share what we have done with my children at home, which makes me very happy". Some others also mentioned the effect on their children.

The tutors had a few suggestions for improvements or changes that might be made, for example they would have appreciated an electronic version of the course materials, as tutor 2 queried "maybe when Alex put his booklet together, he had that electronic version of it, and added some links or clips, video clips and things like that, I don't think... we didn't have an electronic version of it, did we?" (tutor2, post-int). In addition:

> "I think there was a little bit in all of us, I don't know if I'm speaking for both of you, when... maybe there was an assumption that the lesson plans themselves would have been provided. I think there was an assumption about that. I don't know. On my part, there may have been" (tutor1, post-int)

Having said that, they "would have changed it anyway" (tutor2, post-int), "but just have a starting point" (tutor1, post-int) might have helped.

Then they have ideas for a slightly different model of running the courses which keeps the emphasis on teaching the parents (which is rather important for their funding model), but which could also include the children by running the courses over a period of two hours straddling the end of the school day, with the children included during the second hour. This model was tried and tested by tutor2 in other courses, and they were going to test it with the taster workshops they are running:

> "Some of the workshops [...] that we are setting up are going to [...] parents in for the first hour, and then the second hour the children come in after they've finished school, [...] so then the parents can show their children what they did in class" (tutor2, post-int)

Tutor1 was very much in favour of trying this model, because it would give opportunity to "do all the ILJ [Individual Learning Journey] stuff and you can do "this is what we're going to do today", [...], preparing them for the experiment after" (tutor1, post-int). Tutor2 argued that "it just gets their kids talking about it to their friends, and they say "why aren't your parents here?"" (post-int), to which tutor3 added: "and you still have the first hour, so you can concentrate on the parents". They felt this model was particularly suitable to practical, hands-on courses such as they envisaged continuing to run for science.

Results – regional centre 2

The lead tutor in regional centre 2 was interviewed at the beginning of the academic year, when they were on the verge of recruiting for their courses which were due to start in the

last week of the first Autumn half term. They had recently set up a community centre at their secondary school, trying to build better relationships with parents in the area, including those of children at their feeder primary schools. The SifPT offer came at just the right time, as they had already started to develop ideas about using science to bring parents into the centre. They were running "adult classes for parents in different things, so Science for Parents [would] supplement that", but the lead tutor acknowledged that "[they] would have probably done maybe one or two evenings [of science] but this has made it more of a longer project, which is good". Their main aim, however, among those related to the parents, "was ultimately about the students attaining better". Regarding the target audience, the tutor said

> "We've got an open mind. Obviously we want to try and fill the places. Two cohorts, we're thinking, the one cohort, target it at our feeder primary schools, and the second cohort year 9 and 10 students, doing their GCSE at the moment."

The lead tutor was full of praise for Alex Brown's course materials for key stages 2 and 3:

> "The resources that are provided are really good, so it would be a shame not to use them as much as we can. I've used some of them in my lessons, they're good! [...] Because you know what you're doing [as an experienced science teacher], you pick what you want"

The lead tutor described their context. Regional centre 2 is in a deprived area in an inner city, with an affluent area not far up the road. This has a marked influence on how the community centre approaches the local parents, as high levels of literacy cannot be assumed. There is also a group of parents with English as an additional language, as well as a travelling community. Recruitment of parents to the SifPT course was planned to occur at an imminent Open Day, and the regular coffee mornings where parents are invited to meet the school's head teacher. In addition, the school has an app which was developed to facilitate communication with parents. The courses were presumed to become quite hands-on and practical, with very little emphasis on reading.

With regards to the possibility of running the evaluation of SifPT with control groups, the interviewee went one better:

> "I could do that. With the control group, would you want to match the parents? So for example if there's a free school meal kid, would you want the equivalent free school meal kid [...] No [that wouldn't be an awful lot of work], because we've got the data systems, where we can just pull off like for like if you wanted, [...], EAL, boys and girls, [...] that is possible, it would be good for my evaluation as well, to see how these groups..."

Regional centre 2 somehow ran into problems, but did not communicate them to CLL at York until some months later, by which time it turned out that recruitment of parents of primary school children had been abandoned, and only courses with parents of Key Stage 3 children had been pursued. In a telephone conversation with Katherine one of the course tutors (not the lead tutor interviewed earlier, as they had left the project altogether) explained that recruitment had involved phoning all the parents who initially signed up every week to re-invite them to the sessions, plying them with coffee and cake. In addition, the tutors had decided, on the parents' request, to include the children in the sessions – the

parents felt that it was pointless for them to learn things when the objective of the course, ultimately, was for the children to learn them, as KL relayed:

> "Because parents were able to learn alongside their children, they didn't want their kids to miss out, they didn't see the point of them learning if their kids weren't. They were aspiring for their kids to do better, and therefore if their kids weren't there, why bother?" (KL)

The crèche facilities were being used for the parents' younger children (including primary school children). The crèche made a big difference, "but the biggest thing was the refreshments, the fact that they provided tea and cake, [tutor2 at centre2] said that was consistently commented on by parents as being one of the main reasons that they kept coming back" (KL).

As the communication between York and regional centre 2 had broken down, and the courses did not resemble what was intended, the collaboration was abandoned at that point.

Results – York

Introductory comments from the tutor

> "I could see with the key stage 2 course that that made lots of sense because it's stuff that you can take home, and you can do with your kids, and I could see the real value in that, and I could see why parents would really enjoy that, because I think it's really valuable to empower the parents to feel like they're the experts. I think if you do family things, where the kids are there as well, then the parents aren't the experts, they're on the same level as their kids, but by teaching the parents separately, and then allowing them to go home and have those conversations with the kids, the parents become the experts and they can actually influence their children an awful lot more in that position. I think that is really important for raising aspirations of both children *and* parents [emphasis as spoken].

> I wasn't sure how a key stage 4 course would work, because then you're talking a much higher level of content, and I wasn't sure how comfortable the parents would be with that. A lot *more* content [emphasis as spoken], so actually trying to cover enough of it to make it valuable. But also the fact that it was still running in office hours, therefore how many people would still be in a position to be able to attend, given that a lot of people take time off when their children are young, but not so many people take time off when their children are older? What I was really surprised about was how much uptake there was, because we didn't have a vast amount of time that we were publicising for, and we did get a good uptake. We got a number of people who got in touch to say "we can't make it during the day but we'd love to do it if you run one at a different time, please get back in touch".

> But I think, actually, targeting the GCSE is really effective, because parents really want to be able to support their kids at what is a really crucial time in their education" (KL).

This excerpt captures a lot of issues about recruitment, retention, planning, progression, aims and outcomes, and the type of parent that can be expected to attend a course like SifPT in a place like York. These will be revisited in the following sections.

How did course participants find out about the course?

Data about where participants found out about the course are only available for York. Twelve found out through school, with five different secondary schools mentioned by name. Ten were contacted by the Centre for Lifelong Learning because they had attended earlier SifPT courses, four found out from friends, with one mentioning an email from the STEM centre and another mentioning facebook as a source.

Knowledge and attitudes

The participants were from a wide variety of backgrounds, some with (almost) no science qualifications at all, others with science A-levels or even undergraduate-level science or science-related qualifications.

In contrast to the regional centres, where engagement with parents and perhaps attainment of children was seen as the main aims, in York outreach activities and courses such as SifPT have the underlying aims of "strengthening community links between the university and the town, engaging people with the research and the university" (KL). While the stated aims of SifPT (see section 1) were initially much more about engagement and confidence of parents, it became clear from the interviews with parents this year that they were much more interested in gaining knowledge of the science curriculum and the specific topics on offer, than gaining confidence in sharing it with their children. They were essentially already engaged with science, and hoping for their children to be engaged with science, which spurred them on to learn more science themselves in order to be ready for their children's questions, whether related to homework or in more informal settings.

As an example, one parent relayed that their child had benefited directly from the parent's participation in SifPT, as the topic they were learning about at school and were due to give a presentation on, was just the one the parent was learning about in the SifPT course and they shared their knowledge of global warming by means of preparation: "they were using the new scoring system, and [they] effectively got a 7, so that was quite good for [their] presentation". This participant was also one of the ones who were explicit about their main aim being the knowledge, and even more so, that it was for their own benefit first and foremost:

> "I think the biggest one was actually quite selfish, because it was for me; I wanted to learn the science I'd been denied the opportunity of. And especially for this one being the GCSE, I think I had a bit of an idea that "Oh, wouldn't it be great if I could do the GCSE science and get something that I didn't get all those years ago?" But when I saw how hard it was, I'm actually quite relieved that I don't have to do it!"

This reasoning was inextricably linked with the motivation to come on the course, which is further explored below.

Aspirations, confidence and other motivations

Parents and grandparents like those in York attending the key stage 4 SifPT courses, probably already have a reasonable confidence in their ability to learn science and share their knowledge with their (grand)children. This is borne out in participants' questionnaire responses to statements about their general self-confidence, which was already high and did not change (see section 7). They have high aspirations for the children in their care, and would most likely do anything in their power to support their children in achieving the best, whether through courses such as SifPT or otherwise.

The course participants showed a considerable eagerness to learn, not just to learn science but to learn in general. So much so, that at least two of them acknowledged that they

decided to attend the courses simply for their own development, with not much else in the way of aims and motivation in mind (see for example the quote in the previous sub-section). As can be seen from the same excerpt, this parent mentioned that they had originally considered to sit the GCSE exams alongside their child, but have since decided not to.

While many decided to go on the course in order to develop enough knowledge and understanding to help their children with homework, some other reasons were given, for example that it would help them get back into a role of teaching assistant which they were working towards.

Resources and format

The course in York was seen by the CLL tutors as essentially a GCSE revision course, and the course materials were going to comprise the lesson resources and lesson plans. The guidebook accompanying the key stage 2 and key stage 3 courses, as produced by Alex Brown in earlier years, was not going to be complemented by a similar resource for the key stage 4 course. The course participants have taken it as exactly that, "purely revision, really", as one participants instinctively replied when asked what their motives were. They really appreciated it in that way, referring to "discussing revision techniques with Katherine", and with including being pointed towards commercial GCSE revision guides and online resources which complemented the SifPT materials perfectly.

Many participants really appreciated the flexibility that the two parallel sessions each week afforded them, although not nearly all of them had had to make use of this. It was nice to be able to consider it, should they have to miss a session, and one or two people moved from one day to the other when their circumstances changed. One participant had had trouble finding a car parking space on a number of occasions, even forcing them to miss a session or two because they had not succeeded. And while car parking fees did not come up in conversation until the hypothetical prospect of paying for the course was brought up by the researcher, none of them felt that the fees per se had been problematic. If they had been on top of course fees, some of them may have had to think twice about attending. Clearly, the courses being free is very important for attracting the right people.

Would the course participants recommend the course to others?

Almost all the interviewees had talked to people outside their direct family about the SifPT course they were on, and all of them would recommend it to others. Many mentioned other parents at school, mainly at primary schools where parents are more likely to meet at the school gate when picking up children, who would have liked to have been able to go on such courses if they were run again, run in the evenings, or if they had only been able to find out about them in time. Nobody mentioned hearing about other people who would have liked to have gone on the course but had not been able to get a place. Working life was mentioned as a reason why other people did not or would not have been able to go on the course. The participants who had been unable to complete the course, because of changing circumstances in work or family, expressed regret, for example:

> "I was really upset that I could not continue because I loved it! Thought Katherine was an amazing tutor! She made everything understandable and didnt mind how stupid any of the questions were that I asked ..I dont know if you will be running it again, but if I get the chance I will come back and try very hard to work it so that i can complete the whole course."

Children's responses to open questions in the questionnaire

In the post-project questionnaire, the children were asked whether they had noticed a change in the adult attending the course, and to describe these changes. Four children responded accordingly:

- "My [relative] has been more involved in my science homeworks and has talked more in conversations about science."
- "My [relative] is talking about it more."
- "More references to 'apparent scientific foundings', which are not sufficiently backed up by evidence. The course, from what I have heard, does cover, but not fully cover, the current GCSE syllabus"
- "We are doing science experiments and watching science on TVs and YouTube."

A fifth response was received from a child who had indicated they were unsure that the adult had changed in the previous question: "We visited the science museum".

The future for SifPT courses in York

As the tutors in regional centre 1 were asked to talk about their hopes and plans for the future for SifPT courses in their area, the tutor in York was invited to do the same. While the key stage 4 course was a big success according to both participants and tutor, the most powerful outcomes seem to have been achieved in the key stage 2 course as it was run in regional centre 1. Katherine has considerable knowledge of the earlier courses as they were run in York, as she had been involved in expert sessions and other outreach-related activities surrounding SifPT from the start. In light of this, she said:

> "I think the KS2 one probably has more scope for rolling out. I feel like I should say I would really want to roll it out through the university network, but I feel like what they're doing in [regional centre 1] is really really good, and working within community networks is going to be so much more powerful to actually reach people where it can make a really genuine difference." (KL)

She wondered whether a solidly reproducible provision of the key stage 2 courses, repeated every year or even more often than that, might be the most successful in the longer term. She was keen to be able to signpost learners who want to progress to higher level courses. In order to be able to use the current key stage 3 and key stage 4 materials and experience optimally, the centre might develop these into online resources which could be a stepping stone for progression.

Her experience with outreach activities has led to her conviction that repeating courses is the most powerful way to engage new people. With new courses all the time, it is often the people who already benefited from the earlier ones who attend the new ones. This probably has the deepest possible impact on the children in such cases, as they have the largest possible experience in that way, but it limits the range of people who might be reached and who might benefit.

Katherine would have preferred to run two sessions in one day, one in the morning and on in the afternoon, or even one during the day and one in the evening, rather than on two different mornings, like it was done this time. It would have made a big difference in setting out and packing up equipment, and moving round rooms. In addition, it made her commit to being in York for two days each week, without the option to do other outreach activities away from York on such days.

Section 9 Conclusions

Introduction

The courses in York and regional centre 1 have been a success, each in their own way. The problems with regional centre 2 could perhaps have been foreseen, but in a situation where these problems are not communicated until they have got out of hand, the lack of success can only be seen as a learning experience. Selecting partners carefully, on the basis of more than just recommendations, with the knowledge and experience gained this year, will hopefully be more effective in future. Data about regional centre 3, where a very short version of SifPT was run very late in the project, are too sparse to comment on here. The rest of this section will be dedicated to discussion of the issues raised in section 3, directly related to what can be seen as the research questions.

Effects on adults taking SifPT courses

Mirroring earlier findings by West, the adults spoke to the children about what they had learned on the course, both in York and in the regional centres, and they reported an increase in their confidence in doing so, bolstered by their increased knowledge and understanding of the science their children were supposed to be learning at school. Some were keen to progress on to further courses, to increase this knowledge further. One parent had set up a science club for their children and other children from the neighbourhood, and another felt the course provided a good level of professional development to support their role as teaching assistant, for which, anecdotally, they allowed that the course had probably helped them find a part-time job.

Effects on children in families where adults are taking SifPT courses

The data about direct effects on the children were sparse, but there is every indication that children in families where (grand)parents take a significant enough interest in the children's science learning to attend courses such as SifPT, have benefited in some way. Their (grand)parent(s) talked about science more often and more knowledgeably, and took them to places where their science knowledge might be expanded.

Similarly to the situation described by West (2014), children outside the direct family sphere of the (grand)parents involved in the courses are likely to benefit from the courses, e.g. the science club group set up by a parent in regional centre 1, and children in the schools where one of the York parents was going to be working as a teaching assistant. With the wealth of resources the course provided for the participants, families can continue to learn through the internet and revision guides.

Very few children reported on their feelings of change in the questionnaire towards the end of the project, either in themselves or in the adult attending the courses: not many of the children provided those data and '2' (i.e. 'stayed the same') was the most commonly found response. It is possible that they found this style of question too difficult. On the other hand, the responses that were given do match the responses at the two different time points fairly accurately (namely, the data from the different time points did, indeed, show no or very small differences), so this style of question is worth pursuing as a means of data collection in future, with a larger sample, in order to confirm (or refute) the differences participants report at different time points.

One of the aims mentioned in the project proposal is the impact on A-level choices. This is beyond the scope of this evaluation, and requires a far more longitudinal approach. Very few of the adults in the current sample have children who are at the point of A-level choices, and the scope of the project did not allow for involvement with children at that level of detail.

Performance of SifPT courses in the regional centres

The tutors in regional centre 1 were worried about not being (and not feeling like) science teachers at the start. With the initial training period in York and the support from the Centre for Lifelong Learning, the resources and materials available, and the experience of one year's worth, at least one of them definitely feels like a science teacher – for KS2 at least – now, and the others are as enthusiastic at the end of the year as they were at the beginning.

With regards to fidelity of delivery, one of the objectives of the current phase of the SifPT project, the tutors in regional centre 1 were keen to follow York's guidance on what to include in the courses, the type of experiments to use, and the way to run the courses. They sent regular updates to the CLL programme leader, checking back to see whether they were conforming to expectations. They shared their resources freely, with each other and with the researcher. They would have exchanged ideas and resources with other centres if requested, although they acknowledged they had been strapped for time and would have struggled with that initially.

The courses in regional centre 1, after some initial struggles with recruitment and retention, were a great success. So much so, that the centre has decided to include the course into the core provision they offer. The tutors feel confident that they have gained enough knowledge and understanding of science and the SifPT course to continue running it more or less as was intended in the original project, including the informal 'accreditation' of the affiliation with the University of York where appropriate. They have some ideas about how to tailor the organisational model to their needs, dividing the courses into modules which fit their funding model and the facilities schools can provide, as they rely for space and some resources on local schools and centres where they can.

Looking at the data from the interview with the lead tutor from regional centre 2 at the beginning of the project, some of the problems with this centre could perhaps have been foreseen. They had pre-conceived ideas about what they wanted to achieve with parents in their area, which was ultimately related to their secondary school students achieving better in science. Their reasoning, in the light of the theory surrounding 'science capital' (Archer et al., 2015), was totally sound, but perhaps too utilitarian for the aims of SifPT. It may explain why their recruitment of parents of older children was more successful, and why they decided to include the children themselves in the sessions. It is impossible to deduce if the situation would have been different if staff changes in York and regional centre 2 had not happened when they did, and that it would not have been possible to be true to the original aims of SifPT in different circumstances.

National implementation of SifPT courses

Schools, both primary and secondary, are a fertile ground for recruitment: emails, newsletters and word of mouth were all mentioned by course participants, the latter mostly at primary schools in the playground at dropping off and picking up times. Grandparents must not be forgotten in recruitment: some have regular after-school contact with their

grandchildren and may even have a role to play with homework, but the more common factor is the informal learning opportunities they provide through visits to nature and museums. Recruitment and retention of course participants were a serious worry for the group in regional centre 1, and recruitment in York had to be revisited once the course had started as initial recruitment had not lead to an optimal number. An awareness that recruitment and/or retention might be a problem in certain contexts led regional centre 1 to be creative about expanding their usual recruitment activities. In the end, it is quite clear that people would have queued up to join the courses, if only they had known about them in time, and had a fair idea of what to expect. Information dissemination is the crucial task in this case, and school newsletters, via email or otherwise, seem to have reached a suitable audience although there is much anecdotal evidence that potential participants missed plenty of opportunities to find out and take part. It is worth investigating what more could be done to reach these potential participants. Word of mouth was particularly prominent in primary school settings, but only after the courses had started. Taster sessions seem to be a very successful route to recruit participants who have not had any contact with centres before, and they can be used to successfully persuade schools that they should provide the facilities to run a set of courses. They may also be a means to establish the value of a course to participants in situations where courses cannot be run for free, although fully subsidised courses must always be the preferred model in order to provide equal opportunities for potential participants in more deprived areas. The model established in regional centre 1 is therefore exemplary.

With respect to modern forms of data collection, through online surveys, it must be said that small-scale and diverse projects such as SifPT are perhaps not ready. The logistics of getting participants (some of whom may not be digitally engaged at all) aligned with laptops or similar, in an environment with reliable internet connections, were not favourable. It may be better to persist with paper versions for the foreseeable future, until electronic completion can be implemented seamlessly and predictably.

It seems there are at least two different directions which SifPT might take. Key Stage 2 courses, aimed at parents of primary school children, could very successfully be implemented in a family learning setting such as that in regional centre 1, as well as a university setting like York as they have been implemented before. This is testament to the course materials, which can be equally successful in such different settings. The tutors, providing they are enthusiastic and committed, and find themselves supported by their centre leader, do not have to be qualified science teachers as the materials provided by York help them with subject knowledge and pedagogy to such an extent that they can make it their own within one academic year. Key Stage 3 and/or 4 courses, on the other hand, are perhaps best run by more experienced scientists such as secondary school teachers or university lecturers. The project did not go to plan with regional centre 2 but the course participants at York indicated that they would have been happy, generally, to be taught by secondary school science teachers in a secondary school setting, provided the facilities were appropriate and laboratory sessions could be included in the normal run of the course. It should be noted, however, that the prestige afforded by the University of York was seen as important both by course participants in York and in regional centre 1, in different ways. The possibility of more research-active university lecturers with an interest in outreach activities being included in the course sessions should be considered further. Their input was much appreciated by the course participants, as it afforded the course high standing with expert

input at appropriate times. It also means that the courses can be more varied, with teaching load shared.

So where from here? There will always be the issue of funding, and in places where a funding model exists that is similar to that in regional centre 1, the conclusion has to be that a science course at a level at which the tutors in those centres are comfortable to operate – which will be key stage 2 in most cases – will be the optimal choice. There is scope for experimenting with organisational models, running the courses in 5-week or 10-week modules, with possible extensions into further courses, or running them as separate units in order to attract new participants each time. There is scope for experimenting with taster sessions, either separately from the main course or as an initial session. There is scope for experimenting with repeating courses and modules each year or even each school term in some way.

In addition to considerations of funding and organisation, there will always be a trade-off between breadth and depth. Some parents (and children) will benefit most from having the highest possible level of knowledge available to them through SifPT, whereas many more parents might benefit if key stage 2 courses were available regularly and consistently. The choice of what a centre might provide would be guided by the overall aims of the centre, the type of participant they are likely to attract in sufficient numbers, and the availability of tutors and experts at the right level.

References

Archer, L., Dawson, E., DeWitt, J., Seakings, A., & Wong, B. (2015). "Science capital": A conceptual, methodological, and empirical argument for extending bourdieusian notions of capital beyond the arts. *Journal of Research in Science Teaching*, 52(7), 922-948.

Brown, A. (2015). Science is for Parents Too

https://prezi.com/1-yj0ctb5gji/science-is-for-parents-too/

accessed 4jul2017

Burns, J. (2012). Children's science questions 'stump many parents'
http://www.bbc.co.uk/news/education-16612100

accessed 4jul2017

Pell, T., & Jarvis, T. (2001). Developing attitude to science scales for use with children of ages from five to eleven years. *International Journal of Science Education*, 23(8), 847-862.

West, S. (2014). Evaluation of Science for Parents Too Course

https://www.york.ac.uk/media/sei/documents/publications/Evaluation_of_Science_is_for_Parents_Too.pdf

accessed 4jul2017

West, S. (2015). Evaluation of "Science is for Parents Too" Course 2014-2015

https://www.york.ac.uk/media/cll/documents/Science%20is%20for%20Parents%20Too%202015%20Final%20Evaluation.pdf

accessed 4jul2017

York Press (2013). Science support for struggling parents

http://www.yorkpress.co.uk/news/10173249.Science_support_for_struggling_parents/

accessed 4jul2017

Further reading

https://participatoryresearchblog.wordpress.com/2015/08/18/science-is-for-parents-and-grandparents-too/

Appendices

Appendix A. Science is for Parents Too – adults starting the course (primary or secondary as appropriate)

Q1 Please indicate your level of agreement with the following statements:

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I understand the science that is taught in [primary/secondary] schools	○	○	○	○	○
I like to watch science programmes on TV	○	○	○	○	○
I can understand basic scientific ideas	○	○	○	○	○
I can talk about science with confidence	○	○	○	○	○
I read science news stories	○	○	○	○	○
I am confident helping my children with science homework	○	○	○	○	○
I have a good general level of self-confidence	○	○	○	○	○

Q2 How would you describe your overall feeling towards the SifPT course, in three words or phrases?

Appendix B. Science is for Parents Too – children, when adults starting the course

Q1 Please tick the box which is closest to how you feel about these sentences:

	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot
I would consider a career as a scientist	○	○	○	○	○
Scientists help make people's live better	○	○	○	○	○
You need to be clever to be good at science	○	○	○	○	○
Science lessons are among my favourite lessons	○	○	○	○	○
I like to take opportunities to talk to someone at home about science I have been learning in school	○	○	○	○	○
Science is just too difficult	○	○	○	○	○
We have to do too much work in science	○	○	○	○	○
I like to watch science programmes on TV	○	○	○	○	○
I like reading science stories	○	○	○	○	○
I would like to be given a science kit as a present	○	○	○	○	○
We do too much science at school	○	○	○	○	○
I expect to use science in my job after I leave school	○	○	○	○	○
I think science is fun	○	○	○	○	○

Appendix C. Science is for Parents Too – adult post-course feedback

Q1 Please indicate how much of the course you could take part in

- ◯ I completed the course and took part in (almost) all of the sessions
- ◯ I completed the course but only took part in some of the sessions
- ◯ I left the course before the end

Q2 If you did not manage to attend all the sessions, can you please briefly explain why? Is there something we could have done to make it possible for you to attend more of the course sessions?

Q3 Please select the option most appropriate to your situation.

	Please indicate your current level of agreement with the statements					Thinking back to when you started the course, has your level of agreement decreased, increased or stayed about the same?		
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Increased	Stayed about the same	Decreased
I understand the science that is taught in schools	◯	◯	◯	◯	◯	◯	◯	◯
I like to watch science programmes on TV	◯	◯	◯	◯	◯	◯	◯	◯
I can understand basic scientific ideas	◯	◯	◯	◯	◯	◯	◯	◯
I can talk about science with confidence	◯	◯	◯	◯	◯	◯	◯	◯
I read science news stories	◯	◯	◯	◯	◯	◯	◯	◯
I am confident helping my (grand)children with science homework	◯	◯	◯	◯	◯	◯	◯	◯

I have a good general level of self-confidence	○	○	○	○	○	○	○	○

Q4 How would you describe your overall feeling towards the SifPT course, in three words or phrases?

Q5 Which aspect of the course did you appreciate most?

Q6 Is there anything you can think of that would make the 'Science is for Parents Too' course better?

Appendix D. Science is for Parents Too – children – feedback when adults completed the course

Q1 An adult from your family followed (part of) a science course. Have you noticed a change in how they talk to you about science?

❍ Yes

❍ I don't know

❍ No

Q2 Can you please describe any changes in your family which you think may have happened because of the science course? Think about things such as: your family being more involved with your science homework, or watching science programmes on TV, or discussing science news stories, or visiting a science museum. If you think nothing has changed, please just leave this blank.

Q3 Please tick the box which is closest to how you feel about these sentences, and whether things have changed:

	Please tick the box which is closest to how you now feel about the sentences					Thinking back to when your family member joined the science course, do you think you now agree less, more, or about the same with these sentences?		
	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	More	About the same	Less
I would consider a career as a scientist	○	○	○	○	○	○	○	○
Scientists help make people's live better	○	○	○	○	○	○	○	○
You need to be clever to be good at science	○	○	○	○	○	○	○	○
Science lessons are among my favourite lessons	○	○	○	○	○	○	○	○
I like to take opportunities to talk to someone at home about science I have been learning in school	○	○	○	○	○	○	○	○
Science is just too difficult	○	○	○	○	○	○	○	○
We have to do too much work in science	○	○	○	○	○	○	○	○
I like to watch science programmes on TV	○	○	○	○	○	○	○	○
I like reading science stories	○	○	○	○	○	○	○	○

I would like to be given a science kit as a present	○	○	○	○	○	○	○	○
We do too much science at school	○	○	○	○	○	○	○	○
I expect to use science in my job after I leave school	○	○	○	○	○	○	○	○
I think science is fun	○	○	○	○	○	○	○	○

Q4 Thinking about the adult family member who joined the science course:

	Please tick the box which is closest to how you feel about these sentences.					Thinking back to when your family member joined the science course, do you think the sentences are more true now, less true, or about the same, compared to the beginning?		
	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	More	About the same	Less
They know what they are talking about when we talk about science	❍	❍	❍	❍	❍	❍	❍	❍
They know what science I am supposed to be learning at school	❍	❍	❍	❍	❍	❍	❍	❍
They like to talk about science	❍	❍	❍	❍	❍	❍	❍	❍
They take me to places where we can learn about science	❍	❍	❍	❍	❍	❍	❍	❍
They help me with my science homework	❍	❍	❍	❍	❍	❍	❍	❍

Appendix E. Interview schedule course tutors, pre-project

SifPT-e: Science is for Parents Too – evaluation project

Semi-structured interview with SifPT trainers outside the York area. They will be running SifPT courses in their local area, based on the model developed at the CLL at York.

1. AIMS OF THE SifPT PROJECT

I would like you to talk briefly about how you view the main aims of the SifPT project.

- a. What do you see as the main aims of the SifPT project?
- b. Take each pre-set aim (and the ones mentioned by the trainers) in turn and probe for detail – what do each of them mean to the trainer (definition, scope for measurement?!)
    - i. confidence of parents to discuss science with their child(ren);
    - ii. confidence of child(ren) in science;
    - iii. attitude of parent(s) and child(ren) towards science;
    - iv. child(ren)'s attainment in science;
    - v. parent(s)' engagement with the SifPT course
    - vi. [trainer's salient point]
- c. how important are these aims to you, in order of importance?

2. PERSONAL AND TEACHING EXPERIENCE

It is thought a trainer/teacher's own experience and interest, on top of their professional learning experiences, may have an influence on the people who participate in their courses/lessons. I assume that being a SifPT trainer is not a full-time occupation for you. I would like you to talk briefly about how it fits with your other role(s), and about your views of science teaching and learning.

- a. How did you get to the point of considering to become a SifPT trainer? What are your qualifications for these roles?
- b. To what extent are you comfortable with teaching and learning about science?
- c. What is your own educational background? When did you yourself most recently learn science? [Science capital's "What you know"]
- d. What kind of activities do you personally engage in which you would regard to be related to science? [Science capital's "What you do"]
- e. Can you talk about family and friends who may have influenced your views of science? [Science capital's "Who you know"]

3. BECOMING A SifPT TRAINER

I would like you to talk briefly about how you see your role as a SifPT trainer.

- a. What do you expect to gain from the train-the-trainer sessions related to SifPT?
- b. The courses have been a success with parents in the York area, with AB as trainer; what might happen in different areas with different trainers? Is it

important to be able to replicate the project in different areas? Important to whom?

    c. Is there anything you feel you have to add as a trainer which you do not necessarily expect to be part of this train-the-trainer course? If so, what?

4. PERSONAL HOPES FOR SifPT IN YOUR AREA

There may or may not be reasons to think that the SifPT courses, when rolled out nationally, will have the same effects everywhere. I would like you to talk briefly about the opportunities in your area.

    a. What do you think is important for parents to learn regarding science?
    b. Are there specific learning needs for the parents in your area? If so, what are they?

5. THE RUNNING OF SifPT-e IN YOUR AREA

In York, the parents attending a SifPT course, their child(ren), and a group of children whose parents are not attending a SifPT course, are surveyed to investigate the influence the course has on their engagement with and understanding of science. We would like to do the same in your area, and AB and I will be taking steps towards this.

    a. How would you recognise success of the SifPT course in your area?
    b. Did you realise there were plans to do this kind of evaluation regarding your SifPT course? How do you feel about this?
    c. Are there any practicalities we need to be aware of, regarding the running of SifPT-e in your area? If so, what are they?

6. YOUR EXPERIENCES OF SifPT SO FAR

    a. How do you feel about your involvement with SifPT and SifPT-e so far?

Then a final question:

Is there anything you had hoped to say but have not had a chance to yet?

Appendix F. Interview schedule course tutors, post-project

SifPT-e: Science is for Parents Too – evaluation project

Semi-structured interview with SifPT trainers outside the York area. They will have been running SifPT courses in their local area, based on the model developed at the CLL at York.

1. AIMS OF THE SifPT PROJECT

I would like you to talk briefly about how you view the main aims of the SifPT project.

- a. Take each pre-set aim (and the ones mentioned by the trainers) in turn and probe for detail – what do each of them mean to the trainer (definition, scope for measurement?!)
    - i. confidence of parents to discuss science with their child(ren);
    - ii. confidence of child(ren) in science;
    - iii. attitude of parent(s) and child(ren) towards science;
    - iv. child(ren)'s attainment in science;
    - v. parent(s)' engagement with the SifPT course
    - vi. [trainer's salient point]
- b. how have each of these aims fared in your course area? Did your course participants have particular aims in mind themselves?

2. PERSONAL AND TEACHING EXPERIENCE

It is thought a trainer/teacher's own experience and interest, on top of their professional learning experiences, may have an influence on the people who participate in their courses/lessons. I assume that being a SifPT trainer is not a full-time occupation for you. I would like you to talk briefly about how it fits with your other role(s), and about your views of science teaching and learning.

- a. How has it been – to what extent were you comfortable with teaching and learning about science?
- b. Has your involvement with SifPT changed your attitude to science in any way? What kind of activities do you personally engage in which you would regard to be related to science?
- c. How has your circle of friends and family responded to you being involved in a science course?

3. BEING A SifPT TRAINER

I would like you to talk briefly about how you see your role as a SifPT trainer.

- a. Have you gained anything specific from being a SifPT trainer, including the sessions you had in York before you started?
- b. The courses have been a success with parents in the York area, with AB as trainer; how do you feel now about running it in different areas with different trainers? Is it important to be able to replicate the project in different areas? Has it been possible to be true to the original materials? Have you had to make many changes? What kind of changes?

c. As you know, in York the course has been run this year by KL rather than by AB. Have you felt supported by the new team as you imagined you would be when AB was still here?

d. Initially, the idea was to have two other areas of the country where the course would be run, where you in [region X] were one. You and the other team would have had interactions, networking contacts, that sort of thing. That clearly couldn't happen. How do you feel about that?

4. PERSONAL HOPES FOR SifPT IN YOUR AREA

There may or may not be reasons to think that the SifPT courses, when rolled out nationally, will have the same effects everywhere. I would like you to talk briefly about the opportunities in your area.

a. How did it work out for the parents in your area – regarding learning science?

b. Are there specific learning needs for the parents in your area? If so, what are they? [EAL?]

c. Did you get a sense of the reasons why people in your area sought out the SifPT course? If so, can you give me some of them?

5. THE RUNNING OF SifPT-e IN YOUR AREA

In York and in your area, the parents attending a SifPT course, and their child(ren), are surveyed to investigate the influence the course has on their engagement with and understanding of science.

a. What would you say have been the successes in your area?

b. With hindsight, are there things that you, or the team at York, could have done to make things better in your area?

6. YOUR EXPERIENCES OF SifPT SO FAR

a. How do you feel about your involvement with SifPT and SifPT-e?

Then a final question:

Is there anything you had hoped to say but have not had a chance to yet?

Appendix G. Interview schedule course lead

SifPT-e: Science is for Parents Too – evaluation project

Semi-structured interview with York CLL lead for SifPT.

1. YOUR ROLE IN SifPT

   a. You are a named applicant on the grant for SifPT, which includes reference to the evaluation. Can you describe your role in the running of SifPT?
   b. Can you describe how the evaluation of SifPT was organised before this academic year?

2. AIMS OF THE SifPT PROJECT

   a. What do you see as the main aims of the SifPT project?
   b. Take each pre-set aim (and the ones mentioned by the interviewee) in turn and probe for detail – what do each of them mean to the them (definition, scope for measurement?!)
       i. confidence of parents to discuss science with their child(ren);
      ii. confidence of child(ren) in science;
     iii. attitude of parent(s) and child(ren) towards science;
      iv. child(ren)'s attainment in science;
       v. parent(s)' engagement with the SifPT course
      vi. [interviewee's salient point]

3. AIMS OF THE SifPT-e PROJECT

I would like you to talk briefly about how you view the main aims of the evaluation of SifPT, which I have named 'SifPT-e'.

   a. What would you like to see as outcomes of the evaluation of SifPT at this point? Were the aims the same for the York-based KS4 project as they were for the KS3 project(s) in the regions?
   b. Now that some of the regional projects have not gone quite to plan, have the aims changed?

4. THE SifPT TRAINERS AND NATIONAL ROLL-OUT

   a. Can you describe how the SifPT trainers (and their regions, initially) were chosen/recruited?

5. HOPES FOR SifPT IN YORK, AND THE REGIONS

There may or may not be reasons to think that the SifPT courses, when rolled out nationally, will have the same effects everywhere.

   a. What do you think is important for parents to learn regarding science?
   b. How do you think the situation in York compares to that in other regions where SifPT has been or may be taken up?
   c. Can you describe your current thinking about a national roll-out of SifPT?

    d.   Can you describe how you see the future of SifPT?

6. THE RUNNING OF SifPT-e

    a.   How would you recognise the success of a SifPT course?

    b.   I have interviewed some of the SifPT trainers, and hope to be interviewing some of the adult participants in York. What would you hope that can be found out from these interviews?

    c.   It is beginning to look like there will not be a comparison group of children whose parents (or other significant adults) have not been involved with SifPT. How do you feel about that?

Then a final question:

Is there anything you had hoped to say but have not had a chance to yet?

Appendix H. Interview schedule course tutor York

SifPT-e: Science is for Parents Too – evaluation project

Semi-structured interview with York CLL lead for SifPT.

1. YOUR ROLE IN SifPT

   a. You took over the training role from AB very close to the beginning of this year's project. How has it been to take on that role? Had you been aware of the project before this year? Did you have any insight from the earlier phases of the project?

   b. Can you describe the recruitment for this year, with its related problems?

   c. We (you included) had intended to recruit a cohort of control group children. With everything else that has happened, that has not worked out. How important do you think that aspect of the evaluation would have been? Should we have reason to believe that this year is different from previous years, in which that aspect of the evaluation showed "children whose parents attended the courses showed an increase in scientific knowledge throughout the course, with a control group showing smaller increases in knowledge or no improvement in knowledge over the same period" (2015 report). This concerned primary school children – does that matter?

2. AIMS OF THE SifPT PROJECT

   a. What did you see as the main aims of the SifPT project?

   b. Take each pre-set aim (and the ones mentioned by the interviewee) in turn and probe for detail – what do each of them mean to the them (definition, scope for measurement?!)
      i. confidence of parents to discuss science with their child(ren);
      ii. confidence of child(ren) in science;
      iii. attitude of parent(s) and child(ren) towards science;
      iv. child(ren)'s attainment in science;
      v. parent(s)' engagement with the SifPT course
      vi. [interviewee's salient point]

   c. How have these aims fared in your course area? Did you course participants have particular aims in mind themselves?

3. AIMS OF THE SifPT-e PROJECT

I would like you to talk briefly about how you view the main aims of the evaluation of SifPT, which I have named 'SifPT-e'.

   a. What would you like to see as outcomes of the evaluation of SifPT at this point? Were the aims the same for the York-based KS4 project as they were for the KS3 project(s) in the regions in your opinion?

   b. Now that some of the regional projects have not gone quite to plan, have the aims changed?

4. HOPES FOR SifPT IN YORK, AND THE REGIONS

There may or may not be reasons to think that the SifPT courses, when rolled out nationally, will have the same effects everywhere.

    a. What do you think is important for parents to learn regarding science? How did it work out for the parents in your area?
    b. Did you get a sense of the reasons why people in your area sought out the SifPT course? If so, can you give me some of them?
    c. What would you say have been the successes in your area?
    d. With hindsight, are there things that could have been done to make things better in your area?
    e. How do you think the situation in York compares to that in other regions where SifPT has been taken up?
    f. Can you describe your current thinking about a national roll-out of SifPT?
    g. Can you describe how you see the future of SifPT? Course fees? Choice of KS courses?

5. YOUR EXPERIENCES OF SifPT SO FAR

    a. How do you feel about your involvement with SifPT and SifPT-e?

Then a final question:

Is there anything you had hoped to say but have not had a chance to yet?

Appendix I. Interview schedule for (grand)parents attending SifPT course in York

SifPT-e: Science is for Parents Too – evaluation project

Semi-structured interview with course participants in York.

1. BACKGROUND OF PARTICIPANT

    a. Can you tell me a little bit about your education background?
    b. How did you decide to go on the Science is for Parents Too course?

2. AIMS OF SifPT

    a. What did you see as the main aims of Science is for Parents Too?
    b. What do these aims mean to you, and which ones were most important to you? [take the following ones in turn, if appropriate]
        i. confidence of parents to discuss science with their child(ren);
        ii. confidence of child(ren) in science;
        iii. attitude of parent(s) and child(ren) towards science;
        iv. child(ren)'s attainment in science;
        v. parent(s)' engagement with the SifPT course
        vi. [interviewee's salient point]

3. EXPERIENCE OF SifPT

    a. Can you tell me a bit about whether and how you and your family have benefited from SifPT?
    b. How important was it for you that the course was run at the university? How likely would it have been for you to join if it was in a different venue, or run by a different organisation?
    c. How likely are you to recommend a course like Science is for Parents Too to your friends and acquaintances? Have you discussed the course with anybody outside your direct family?

Then a final question:

Is there anything you had hoped to say but have not had a chance to yet?

Appendix J. Overview of data collected from adult course participants and children who completed questionnaires in both phases

The questionnaires presented the participants with Likert-type scales, where 1 means 'strongly disagree' (or disagree a lot) and 5 means 'strongly agree' (or agree a lot). For the 'change' they were presented with a 3-point scale, where 1 means 'decreased', 2 means 'stayed about the same' and 3 means 'increased'. See also appendices A-D.

Participants 11004 and 12002 are from one family, and so are participants 11003 and 12004. For the others the link is not totally sure, but 12005 and 11006 are most likely from one family, and so are 12007 and 11011. Participant 12007 has a sibling who did not fully complete the questionnaires and those data are not included here.

ID	I understand the science that is taught in [primary/secondary] schools			I like to watch science programmes on TV			I can understand basic scientific ideas			I can talk about science with confidence			I read science news stories			I am confident helping my (grand)children with science homework			I have a good general level of self-confidence		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
11001	5	4	2	5	5	2	4	4	2	4	4	2	2	1	2	4	4	3	3	4	2
11002	4	4	3	4	4	2	4	4	2	3	3	3	3	4	2	3	3	3	4	4	2
11003	4	4	3	5	4	3	4	4	3	4	4	3	4	5	3	4	4	3	4	4	3
11004	4	5	3	4	4	3	4	5	3	3	5	3	3	4	3	4	5	3	4	5	3
11006	4	5	3	5	5	3	4	5	3	4	5	3	4	5	3	4	5	3	4	5	2
11009	4	5	3	4	5	2	4	5	3	4	4	3	4	4	2	3	4	3	4	4	3
11010	5	4	3	4	4	2	4	4	3	3	4	3	4	4	2	3	4	3	3	4	2
11011	1	5	3	4	5	3	2	5	3	1	4	3	4	5	3	1	5	3	5	5	3
11012	4	5	3	5	5	2	4	4	3	2	4	3	5	4	2	2	5	3	4	4	3
11013	5	4	3	5	4	3	4	4	3	2	3	3	3	4		3		3	3		2
11016	3	3	3	4	4	3	3	4	3	2	4	3	3	3	2	3	4	2	4	3	3
11017	5	4	3	5	4	3	5	4	3	2	3	3	3	3	3	2	2	3	4	4	3

ID	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
11018	5	5	2	4	4	2	4	5	3	3	4	3	4	5	2	3	5	3	4	4	2
31007	5	5	3	5	4	2	5	5	3	5	5	3	5	4	2	5	5	3	5	5	2

Table 2. Adult course participants' responses to the same statements at the beginning (pre) and the end (post) of their course, with 'change' representing their response to the question whether they thought their position at the 'post' time point had changed since they started the course, with hindsight.

ID	I would consider a career as a scientist			Scientists help make people's lives better			You need to be clever to be good at science			Science lessons are among my favourite lessons			I like to take opportunities to talk to someone at home about science I have been learning in school			Science is just too difficult			We have to do too much work in science		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
12002	3	4	2	4	5	2	2	1	2	4	4	2	2	3	2	1	1	2	1	3	2
12004	5	5	2	5	4	2	3	2	2	5	5	2	3	4	3	1	1	2	2	4	2
12005	5	1		5	5	3	5	5		5	2	3	5	2		1			1	2	
12007	5	4		5	5		4	4		5	4		4	3		2	2		2	2	

ID	I like to watch science programmes on TV			I like reading science stories			I would like to be given a science kit as a present			We do too much science at school			I expect to use science in my job after I leave school			I think science is fun		
	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
12002	4	4	2	3	4	2	3	4	2	1	2	2	3	3	2	5	5	3
12004	4	5	2	4	3	2	3	4	2	1	2	1	4	5	2	5	5	2
12005	4	5		5	5		5	5		1	1		2	1		5	5	
12007	4	4		4	3		3	2		2	2		4	4		5	4	

Table 3. Children's responses to the same statements at the beginning (pre) and the end (post) of the course their family member attended, with 'change' representing their response to the question whether they thought their position at the 'post' time point had changed compared to that at the beginning.