

## 'WE ARE RESEARCHERS'

### Child-led research: children's voice and educational value

#### 1 SUMMARY

This paper presents the findings from a pilot study conducted in an English community primary school with 10 and 11 year-old pupils (Year 6), where six child-led research projects were facilitated during a five-week teaching programme. Qualitative and quantitative evidence was collected to establish pupils' views of their learning experience and to evaluate the effects of this self-guided approach on pupil learning. Results showed that child-led research is a feasible approach for establishing children's views on their learning experience but more time and a feedback mechanism, such as a school council, are needed to make child voice effective. The qualitative and quantitative evidence showed that the pupils were interested, highly motivated and positively engaged with the project. Self-report scores for engagement were significantly higher than baseline reading. Value, team work, ownership and choice and teaching were factors which encouraged engagement. All parties felt that the project had educational value. The results from the current pilot are very encouraging, they suggest that 'children as researcher' projects not only provide a vehicle for child voice, but they can also provide educational benefits for the children undertaking such research.

#### 2 INTRODUCTION

##### 2.1 Background

The 'children as researchers' movement was initiated by the 1989 United Nations Convention on the Rights of the Child (UNCRC), which is a statement of the civil, political, economic, social and cultural rights of children. Article 12 (respect for the views of the child) of the UNCRC states that "Every child has the right to say what they think in all matters affecting them, and to have their views taken seriously". Article 13 (freedom of expression) goes further, stating that "Every child must be free to say what they think and to seek and receive information of any kind as long as it is within the law." (UNICEF, 2009, p. 2). Articles 12 and 13 place the child as an active participant in the decisions that affect their lives (Jennifer & Cowie, 2009). Early pioneers of the 'children as researchers' paradigm saw the need to give children a 'voice' by changing the focus of their research from children as subjects of research to children leading research projects. In 2003 the Children's Research Centre was established by Mary Kellet of The Open University. It has since played a leading role in promoting child-led research in the UK, supporting children to carry out research projects of importance to them. Over the past decade the 'children as researchers' movement has continued to gather strength and the 'Young People: Doing and Using Research to Change Schools and Communities' conference in 2011, hosted by the Institute of Education, University of London, illustrates the movement's popularity, both nationally and worldwide.

In addition to providing a vehicle for children's voice, child-led research may also provide educational benefits for children undertaking such research. Several authors have argued that a project-based approach to learning can increase interest and motivation for pupils and maximise self-efficacy, self esteem and engagement (Blumenfeld et al., 1991; Kucharski, Rust, & Ring, 2005; Liu, Wang, Tan, Ee, & Koh, 2009; Yamzon, 1999).

## 2.2 Measuring learner approach

In 2008 'Project Qualifications' aimed at 14 to 19 year-olds were introduced in England, Wales and Northern Ireland. The intention was that they should motivate learners to combine their prior knowledge and experience with new learning to solve concrete problems. In many ways the project qualifications are akin to a child-led research project, where learners are encouraged to pick a topic of interest to them and use research skills to investigate their chosen topic. Daly and Pinot de Moira (2010) applied a learning approach model (Biggs, 1987b; Kember, Biggs, & Leung, 2004) to investigate performance in the Extended Project Qualification (EPQ) pilot. The model they used splits learning into deep approach and surface approach. A deep approach is driven by an intrinsic motive, learning for learning's sake, and the focus is constructing a deep understanding of the given topic. A surface approach is driven by an extrinsic motive, to pass an important exam, for example, and the focus is to complete the task with the minimum effort for the maximum outcome (Daly & Pinot de Moira, 2010).

The learning approach adopted by a learner is dependent upon the learner's personal characteristics, instructional practices, social factors, and the type of assessment (Brookhart, Walsh, & Zientarski, 2006). Providing varied and diverse tasks which are meaningful and challenging can promote a deep approach to learning as they can facilitate intrinsic interest. Equally, giving children control over their learning by allowing them choice can promote a deep approach to learning and result in greater engagement (Assor, Kaplan, Kanat-Maymon, & Roth, 2005; Biggs, 1987a). Daly and Pinot de Moira (2010, p. 179) found that:

*'attainment on the EPQ was positively related to intrinsic motivation; clearly a desirable attribute for lifelong learning but also an indication that the qualification may encourage students to be more innovative and creative about their learning.'*

This evidence suggests that project based learning promotes a deep approach to learning for post-16 year-old learners. The current study investigated the effects of child-led project work on learning approach in a primary context.

## 2.3 Aims

The present study's focus stems from the work conducted at the Children's Research Centre, which has successfully worked with learners as researchers. The current study was inspired by the two theoretical standpoints of pupil voice and learner approach, resulting in two research objectives: to establish children's views of their learner experience, and to evaluate a 'children as researchers' approach to learning in a primary school context. Consequently, it was hypothesised that the child-led projects would promote a deep approach to learning and that the projects would result in an increase in pupils' self efficacy.

## 3 METHOD

### 3.1 Participants

An opportunistic sample was taken from a community primary school catering for 4 to 11 year-old pupils and based in the South East of England. The whole of one Year 6 class of 30 mixed ability pupils (16 female, 14 male), aged either 10 or 11 years, took part in the pilot. The project was evaluated by means of two questionnaires, star ratings, an interview and a focus group. All but one child agreed to take part in the questionnaires and all 30 children agreed to take part in the star ratings. The class teacher, who was involved throughout the project, participated in the interview and selected six pupils (three female, three male) to participate in the focus group.

## **3.2 Materials**

### *3.2.1 Lesson plans and teaching materials (Appendix 1)*

Kellett's (2005a) teaching programme was adapted to produce lesson plans for the 5-week period. The lessons covered: an introduction to research, ethics and research questions, research materials, research methods (questionnaires, interviews, and observation), material design, data entry and analysis, and writing presentations. The children were each given research folders and research diaries, which included all the materials for the lessons and the lesson plans. All of the materials were design specifically for this study. The class teacher reviewed the teaching materials prior to the taught programme to ensure that they were appropriate for teaching to this age group.

### *3.2.2 Star ratings (Appendix 2)*

Star ratings, designed specifically for this study, were included in the research diaries and were designed to provide a self-report measure of engagement. The star ratings fell into two categories: ratings of the quality of the lesson and ratings of the quality of the pupils' engagement. At the end of each lesson the pupils were asked to provide star ratings and respond on a four-point Likert scale (1 star = poor, 4 stars = very good). A four-point scale was used as research has shown that young children can struggle with the 'middle' category of the standard five-point scale (Bell, 2007).

### *3.2.3 Baseline questionnaire*

The baseline questionnaire (see Appendix 3) comprised 17 items, 12 of which were designed to provide an understanding of the way in which pupils were motivated and studied for their normal lessons. These items were adapted from the School Motivation Questionnaire (Marsh, Craven, Hinkley, & Debus, 2003), the Learning Process Questionnaire (Biggs, 1987a) and the revised two-factor version of the Learning Process Questionnaire (Kember et al., 2004). By design, the baseline questionnaire was intended to comprise three items from each of the four sub-scales originally identified in the study by Kember et al. (2004): deep motive, deep approach, surface motive and surface approach. A further three items were adapted from the New General Self Efficacy Scale (Chen, Gully, & Eden, 2001) and were designed to provide an understanding of the pupils' confidence in their academic ability. The final two items were designed to provide an understanding of how pupils engaged in their normal studies. All responses were made on a four-point Likert scale. Where the items were adapted from existing questionnaires, rewording was required to make the language accessible to 10 and 11 year-old pupils.

### *3.2.4 Project work questionnaire*

The project work questionnaire (see Appendix 4) comprised 21 items, 16 of which were adapted from the baseline questionnaire to relate specifically to the project lessons, with one item excluded as it did not relate to the project lessons. The additional five items were adapted from the Extended Project questionnaire (Daly & Pinot de Moira, 2010) and were designed to elicit pupils' views of the project. Once again, the items were worded to make the language accessible to 10 and 11 year-olds, and responses made on a four-point Likert scale.

### 3.2.5 *Focus group schedule (Appendix 5)*

A semi-structured interview schedule was used to facilitate the focus group discussion. The schedule covered five general areas: engagement/enjoyment, control/ownership, assistance, group work, and improvements. However, there was flexibility to explore other relevant themes as they arose.

### 3.2.6 *Interview schedule (Appendix 6)*

A semi-structured interview schedule was used to facilitate the interview. The schedule covered four general areas: content/skills, learner approach/outcomes, ownership, practicalities and future improvements. Other relevant themes that arose could be explored.

## 3.3 Procedure

### 3.3.1 *Taught programme*

All parents were contacted prior to the project lessons and each gave consent for their child to take part in the study. Pupils attended five, two-hour project lessons over a five-week period. The project lessons were part of normal teaching time and the children's participation in the project lessons was compulsory. During the five-week period, the pupils were taught research methods and conducted a research project of their choice based on the topic of 'school' in groups of five (as 30 individual projects would have been impossible to supervise concurrently). In the initial lesson the pupils were asked to write down their ideas about school on an 'idea spider'. The pupils then discussed their favourite topics in their groups and used an 'ideas sheet' to help them come up with potential research questions. See Appendix 7 for the full list of the children's potential research questions. The final research question was decided via a vote within each group where, having discussed several options, the pupils picked their favourite question. A team of four researchers and one teacher from the school helped run the sessions.

### 3.3.2 *Evaluation*

Throughout the pilot, pupils were made aware that all data would be treated anonymously and that they could withdraw their participation from the evaluation at any time. Consent forms were based on child-friendly designs developed by Jennifer (2007). The baseline questionnaire was completed in the first lesson, allowing an evaluation of motivation before and after the project lessons. The project questionnaire was completed at the end of the five-week period. The star ratings were completed at the end of each lesson.

One week after the projects were completed the focus group was conducted with six pupils, one child from each research group, recruited by the class teacher. This methodology was chosen for two reasons. Firstly, it encourages interaction between participants and triggers insightful discussion which would not necessarily arise during a one-to-one interview. Secondly, it is participant-led rather than researcher-led, which creates a collaborative dynamic (Kitzinger, 1994). This was particularly important for the current study as the focus group took place within the school environment where there is an inherent power imbalance between adults and children (Bucknall, 2010). Through applying a participant-led methodology, it was hoped that the power imbalance would be reduced and children would feel less inhibited in sharing their thoughts and views (Jennifer & Cowie, 2009). The focus group was facilitated by an experienced researcher uninvolved in the project lessons. The class teacher was interviewed separately by the experienced researcher. The interview and focus group took place after the pupils had completed their projects and each lasted thirty minutes.

## 4 RESULTS

### 4.1 Children's research topics

Each project group had a name which was decided upon by the members of the group. The group names and research questions are listed below:

- *Bananas*: What do people do when they fall out with their friends and how do they feel?
- *Blue Bananas*: What sports do people prefer?
- *Custard Creams*: Is P.E. more popular with girls or boys in year 4?
- *Gummy Bears*: What gender does more sports?
- *Purple Penguins*: Do you enjoy art?
- *Venomous Vipers*: How sport affects how children learn

Handouts from the children's presentations are included in Appendix 8. Despite developing a variety of potential topics ideas during the idea formation stage, four of the six groups chose a research question about sport.

### 4.2 Questionnaire analysis

The small sample size of 29 participants prevents any generalisation and caution should be exercised when interpreting the findings from the questionnaires.

#### 4.2.1 Self efficacy

Three self efficacy items were included on the baseline and project questionnaires to allow evaluation of whether a self-guided approach to learning would increase the pupils' levels of self efficacy. Despite being worded identically, the internal reliability (Cronbach's  $\alpha$ ) was lower for the baseline questionnaire self efficacy items (0.69) than the equivalent project questionnaire items (0.88). The self efficacy items on the baseline questionnaire were the first items the pupils had to answer as part of the current study, and the differences in reliability might be due to their lack of familiarity with answering questionnaires. Nevertheless, the Cronbach  $\alpha$  scores were sufficiently high to have confidence in the reliability of the self efficacy scale and all items correlated positively (see Appendices 3 & 4 for the correlation matrix).

Scores on the self efficacy items were aggregated for the 28 pupils who had complete data. A paired, one-tailed *t*-test was conducted to evaluate the impact of the project on pupils' self efficacy. There was no significant change in self efficacy over the period of the project from baseline questionnaire ( $M = 9.71$ ,  $SD = 1.61$ ) to project questionnaire ( $M = 9.39$ ,  $SD = 2.35$ ),  $t(27) = 0.93$ ,  $p = 0.180$ .

#### 4.2.2 Learner approach

Whilst the internal reliabilities (Cronbach's  $\alpha$ ) were relatively high for the deep approach items (baseline questionnaire  $r = 0.81$ , project questionnaire  $r = 0.81$ ), they were low for the surface approach items, particularly in the baseline questionnaire ( $r = 0.13$ , project questionnaire  $r = 0.73$ ). Furthermore, the surface approach items in the baseline and project questionnaires had weak correlations (see Appendices 3 & 4). In conjunction with the correlation matrices, a principal component analysis (PCA) was used as a tool to help explain and group together learner approach items in a meaningful way (e.g., Tabachnick & Fidell, 2001). Whilst PCA is non-parametric and it should, therefore, be more robust to small sample sizes than factor analysis, the sample size in the current pilot is too small to use PCA results in a meaningful, weighted post-hoc analysis. However, PCA was used in this instance to confirm whether the

items correlated in the expected fashion, rather than as a basis for a weighted analysis. PCA of the learning approach and engagement items confirmed that the internal structure of the data did not correspond with the intended scales of deep approach, surface approach and engagement. PCA of the baseline questionnaire revealed the presence of four components with eigenvalues exceeding 1, explaining 36.7, 13.8, 12.7, and 8.5%, respectively. PCA of the project questionnaire also revealed the presence of four components with eigenvalues exceeding 1, explaining 36.7, 20.3, 9.7, and 8.9%, respectively. However, inspection of the scree plot revealed a clear break after the first component in both questionnaires, with each having the same items highly loaded on this first component. The make-up of the items in the remaining three principal components differed between the baseline and project questionnaires. The evidence supporting the second, third and fourth principal components as providing a valid measure of learning approach was weak and it was, therefore, decided to retain only the first component for further analysis.

All of the 'engagement' and five out of the six 'deep approach' items were loaded onto the first component in the baseline questionnaire and project questionnaire. The meanings of the items were evaluated and it was observed that all the items related to positive interest and engagement. The internal reliabilities of the new 'engagement' scale were high (baseline questionnaire 0.90, project questionnaire 0.88) and all the items correlated positively with one another (see Appendices 3 & 4).

Scores on the 'engagement' items were aggregated for the 25 pupils who had complete data for all items (four of the 29 pupils who agreed to take part in the evaluation had omitted at least one answer). A paired, one-tailed *t*-test was conducted to evaluate the impact of the project on participants' engagement. There was a significant increase in mean engagement score from baseline ( $M = 19.48$ ,  $SD = 4.72$ ) to project questionnaire ( $M = 21.80$ ,  $SD = 4.48$ ),  $t(24) = 3.03$ ,  $p = 0.003$ .

#### 4.2.3 Project questions

Five additional items were included in the project questionnaire which related directly to the project process. The mean scores of the pupils' responses indicated that the children felt that they had learned new skills whilst working on their projects (see Appendix 4).

### 4.3 Star ratings

The star ratings were designed to provide a measure of engagement with the project lessons. Unfortunately, on two out of the five project lessons not enough time remained for the children to give their star ratings. As such, these ratings are retrospective and may well be inaccurate as a result. Mean ratings from each lesson can be seen in Appendix 9. The mean star ratings for the lessons and the children's performance were high, above 66% in all cases. There was an increasing trend apparent in the mean ratings for 'fun', 'paying attention', 'trying hard' and 'good work' as the lessons progressed.

### 4.4 Interview and focus group analysis

Data from the interview and focus group were analysed using thematic analysis (Braun & Clarke, 2006). The final themes were defined by their extensiveness or by the participants' strength of feeling for a particular issue. Views were fairly homogenous within the focus group and the children were generally in agreement on most issues raised, with counter views offered on only a few occasions. The views from the teacher interview generally concurred with those elicited from the focus group. Five main themes were identified in the analysis: value, team work, ownership and choice, level of support, teaching, and time. These themes are discussed below with illustrative quotes. Pseudonyms have been used to preserve anonymity.

#### 4.4.1 Value

The children enjoyed taking part in the project and engaged in the lessons because they felt that the project had value. Three factors were identified in the analysis as contributing to the project's value: usefulness of the research skills taught, aid in transition to secondary school, and unique opportunity for the pupils.

The teacher felt that the depth of the process taught the children 'key skills' which were not covered elsewhere in primary education. It was felt that the project would help the children in their transition to secondary school. The teacher commented that the project lessons added to the holistic approach to child development taken by the school and that all of the children had benefited from the experience. The children also felt that the project would advantage them in secondary school, which was unsurprising given that the teacher had reinforced this message to the pupils during the project lessons.

*'I think the whole concept for me was brilliant, um because I know that they will be using it in years to come'*

Teacher

The pupils were aware that they were the only class taking part in the pilot. This exclusivity added value to the project, with pupils reporting feeling unique and special.

*'ah it sort of makes you feel a bit important, in a way because you feel quite important, because you're actually doing something that you don't normally do.'*

Sarah

*'that those kind of skills, no other Year 6 in the country is going to have. And they are really up for that, they like the idea that they were unique'*

Teacher

#### 4.4.2 Team work

An interesting finding was the importance placed on working in a group. The children felt that group work was one of the best things about the project, saying that this made it enjoyable and interesting. The children talked about some of the difficulties of working in groups and the steps they had taken to overcome these. They decided upon 'team rules' at the beginning of the project, which proved very useful for resolving disagreements. They felt that working on the project had taught them valuable team-building and communication skills.

*'we didn't get along all the time because one, we don't really, I don't hang around with anyone, well apart from one person, in my group and it was very difficult to um, get their ideas because I didn't really know them as well-'*

Rebecca

*'- yeah you have to communicate with them'*

Rebecca

*'but if we had had our choice in groups then it would have been a bit in some ways harder and we wouldn't learn as much team building skills'*

Charlie

The teacher strongly felt that working in groups benefited the children.

*'I think children, especially the lower end, would have switched off (had they not been in groups), um the upper end would have got frustrated because they'd have the ideas but then they would have no-*

*one to bounce those ideas off of... team work for me in this kind of thing is really important.'* Teacher

However, the teacher did not view the project as a unique opportunity for the children to learn team skills, as they often work in groups as part of their normal lessons. Working as a team also motivated the children as they did not want to 'let their team down'. The children talked about making an effort to include everybody and trying to motivate those in their group who had lost focus.

*'and if there was one person that was just like sitting back in their chair or talking to other group or fiddling with like a paper clip or pencil or something, we'd go up and say um what do you think of this idea, have you got any ideas, we wouldn't just leave them to it'* Rebecca

The children and the teacher felt that the group size of five was appropriate and neither party expressed an interest in doing the project on an individual or pairs basis.

#### 4.4.3 Ownership and choice

The children felt that they had choice and ownership of their projects, which had a positive impact on their motivation and engagement in the project lessons. The children were self-motivated and they talked about working hard to finish 'their' projects. The children also voiced a real sense of achievement at having completed the project.

*'when they (other group members) were just like, walking around doing their own thing, we'd even, sometimes we'd tell them, well just tell them to think about what they're doing, cause they're actually, it was all our, it was all our choice to do this, so'* Charlie

*'yeah, because we've um, we've worked really hard to um try to get the best results that we could and even though, even though there were a few mishaps... um we still got quite good results at the end'* John

Whilst the children enjoyed being given the choice, they described coming up with ideas and agreed that doing their research project within their groups was difficult. Although working in groups led to some disagreements, the children generally felt that team work allowed them to develop better ideas than if they had worked alone.

*'like questions and what we are going to do it all about. That was kind of difficult. Cause some, some of us um wanted to do one thing and some of us wanted to do the other thing'* John

*'yeah and then people would, some people would think that's a great idea lets use that, where as other people might have an even better idea, and try and put it across to people, and if they put it across in a good way then it would be more likely we'd do that.'* Charlie

Working as a group did not reduce the children's feeling of ownership. Most children felt that they had all had a say in their project and although one child described a power struggle between girls and boys within his group, he felt that this was resolved by the end of the project with all parties being able to make a contribution.



The teacher felt that the children needed more support with idea formation. She felt that the children had 'tunnel vision' when coming up with their research project, locking onto a topic of interest to them and being unable to think more widely.

*'Um I think the limitation came with with, with, you know, the ideas. Um, they needed to understand that there were lots more ideas out there that they could have got into... You know they went for the, in a way, the easy option'*  
Teacher

The teacher suggested that a longer class brainstorming session in the very first lesson would have helped the children come up with more ideas for their research project.

#### 4.4.4 Teaching

The teaching support provided by the researchers was intended to guide the children whilst allowing them to come up with their own solutions to the problems they faced within their research projects. The teacher commented that at first the children were being 'spoon fed', but that the researchers soon learned how to guide the children without providing ready answers.

*'it was wonderful listening to how they (the research team) were just allowing the children to come back to them.'*  
Teacher

The children felt they had adequate support most of the time. They said that they felt comfortable asking for help and that help was usually provided quickly when needed. However, the children did discuss instances where they did not receive immediate help. Whilst they described feeling frustrated on occasion, in most cases they worked out the problem by themselves, which they found to be rewarding and confidence building.

*'sometimes we would ask a question that we actually probably knew if we'd thought.'*  
Charlie

*'-yeah, that's kind of better in a way because then you think you're kind of proud of yourself in a way that you worked it out without having to ask a teacher. Cause sometimes you can do it, you just want kind of, you just want someone there to make sure you're doing it right'*  
Rebecca

Participants found that the level of support was adequate. The teacher was confident that two trained teachers would be able to supervise the whole class if the exercise was to be repeated.

*'Obviously it depends on the make up of the class... it's harder work but it's stimulating for a teacher so I think you know two could do that (run the project), two trained people that are used to that.'*  
Teacher

The teaching materials and activities affected the children's engagement with the project. The children found the activities interesting and one child said that this made the research methods easier to learn.

*'because normally you would like write... but you made big posters and powerpoints about it instead – so it made it much more entertaining, and fun and easy to learn.'*  
Sarah

The children found planning, implementing, and presenting their projects challenging. Whilst some children commented that they found some aspects of the project difficult, all of the children seemed to relish the challenge. In general the teacher felt that the project lessons were stimulating and accessible to the whole ability range of her class, although she felt that the

amount of writing required resulted in the lower ability children struggling with some of the activities. She felt that, for future projects, activities should be altered to reduce the amount of writing required from each child, either through the use of tape recorders or by providing one folder per group, so that filling out the worksheets could be shared among group members.

*'and doing the power-point was quite hard trying to re-write the information you'd done because you hadn't written it'. Rebecca*

It was anticipated that the individual research folders, which included all the materials for the lesson and the lesson plans and diaries, would help the children to feel some ownership and control of the project. The children did not reflect on how the folders affected their sense of ownership, although they did feel that the folders helped make the lessons organised, clear, and free from disruption. The children also enjoyed the fact that everything was printed in colour, a luxury the school cannot afford and they said that this also helped make the materials clear.

*'at the beginning of the lesson like get out sheet 1 from like stage 2, cause we had it all organised in the booklet what they'd done, and so yeah – it was very organised and they just told us what to get out at the beginning of the lesson, so there was no hassle during the lesson ... and so that didn't stop us from our train of thought in the lesson'*  
Rebecca

#### 4.4.5 Time

The project lessons took place over a double period and, due to time restrictions, a fair amount of material was covered in each lesson. The children had mixed feelings about the length and intensity of each lesson. On the one hand, the fast pace and continuous working kept the children focused, but on the other hand, the children found the lessons tiring. The teacher felt that the pace of the lessons kept the children engaged, she did not comment on the length of the lessons.

*'doing two lessons of it, it's kind of good cause you're involved and you're, um, you kind of know what you're gonna write and you can't really forget your thoughts, but then it can be very like, heavy'*  
Rebecca

*'and you sort of carried on with the lessons on the next lesson so they sort of made the lesson a bit too long'*  
Sarah

The teacher and pupils felt that a lack of time had a negative impact on the project. Lack of time resulted in the children not achieving all that they had set out to achieve, feeling that the work was rushed and feeling pressured. The teacher felt that the lack of time prevented children from reflecting on their decisions, which was a valuable opportunity missed. All the pupils felt that more time to do the project would have improved learning. The teacher suggested that an eight-week period during the autumn term would be ideal for future projects.

*'we had to fit in a certain amount of things it was quite rushed, and so when we were doing the last, the powerpoint at the end, the kind of overall what we had done and what we found out it was very rushed because we had to finish the poster we did and then we had to try and fit that in as well'*  
Rebecca

*'Yeah, you, it needs to be um, it needs to be um, over a longer period of time cause we had five weeks and really you needed most of this term to be able to do it in the depth and not to rush it.'*  
Teacher

## 5 DISCUSSION

The six groups managed to complete their project in the narrow timeframe and produced interesting findings. The children actively engaged with the project, the activities were accessible to the lower ability children and yet challenging for the higher ability children. The children mostly enjoyed working in groups and some really interesting discussions arose from the group work. The children were able to plan, analyse and critique their research projects. This age group proved themselves to be more than capable of conducting meaningful research of their own design.

### 5.1 Objective 1: to establish children's views on their learner experience

The first objective of the current study was to establish pupils' views on their learning experience. During the interview, the teacher voiced the opinion that a lack of variation in research questions came as a result of children not fully exploring their ideas in the topic area. Analysis of the potential research questions (Appendix 7) showed that the children initially had a variety of ideas on a range of topics, yet four out of the six groups chose a research question about sport. The setting in which the children conducted their research may have biased their choice of research topic. Firstly, the children worked in groups and had to decide their research question by popular vote. The teacher described the children as being a 'sporty lot' and there may have been an element of peer pressure to be seen as enjoying sport.

Secondly, all of the research was conducted within the classroom, where previous research has found that the imbalance in the adult-child power relationship has inhibited child voice (Kellett, 2005b). Whilst there was no intention to restrict the children's choice, the children may not have pursued their more controversial questions (see Appendix 7) as they may have felt uncomfortable challenging the school authority and instead chose to research 'safe' topics like sport. This became apparent when analysing the contents of the 'idea' sheets. One group's 'ideas' sheet discussed reviewing school rules and the children wrote '*some rules can't be changed*' as a reason for not pursuing the topic.

Equally, the children may have chosen topics which they felt would please the teacher, either consciously or subconsciously. Several authors have cited the importance of topic choice in children as researcher projects and the difficulties of conducting child-led research in the school environment (Bucknall, 2010; Fielding & Bragg, 2003; General Teaching Council (GTC), 2009; Kellett, 2005b, 2009). The child's choice of research question is fundamental to the 'children as researchers' paradigm because the central premise is that children investigate the questions which are important to them. Any interference in choice filters children's views through adult perspectives and reduces the child's voice (Bucknall, 2010). Pre-existing power relationships within the school environment and school agendas have been seen to restrict children's choice when working in the school environment (Bucknall, 2010; Kellett, 2005b).

The five-week time scale proved to be challenging and a limiting factor for the children's research projects. Whilst the children found interesting results, the findings were relatively simple. The teaching programme aimed to teach the children the greatest number of research techniques in the time allowed and they were encouraged to adapt or invent their own techniques should they feel they were more appropriate. Nevertheless, interview and questionnaire techniques were covered in the most detail and the majority of the class used these techniques in their research. Had the children had more teaching time on different research techniques they may have been able to ask more elaborate research questions. Although many of the groups wanted to include more pupils in their research so that they could compare year groups, this was not possible in the time available for data collection.

The project was run in the final term of the school year. This time was chosen as the school timetable had more flexibility after the children had completed their Key Stage 2 tests as part of the National Curriculum. However, as the children were leaving for secondary school at the end of the term, there was little time for them to complete their projects and disseminate their findings to the school. The children were due to present their research to the head teacher and the rest of the year group, but this was cancelled due to other commitments. From a child voice perspective, this is a particularly important shortcoming of the pilot; the children's views were not heard by those who make decisions on their behalf. Future projects would be best run in the first term, when there is more time for completion and dissemination. A feedback mechanism within the school, such as a student council, would also be beneficial and may encourage pupils to pursue more challenging research questions.

## **5.2 Objective 2: to evaluate a 'children as researchers' approach to learning in a primary school context**

### *5.2.1 Motivation and engagement*

It is clear from the qualitative and quantitative evidence that the children positively engaged with the project and were highly motivated. The questionnaire analysis revealed that scores on the engagement items were significantly higher for the project than suggested by the baseline questionnaire. The star ratings showed that the children rated the lessons and their performance highly, perhaps unsurprisingly given the self-report nature of the star ratings. There was a slight increase in mean ratings for 'fun', 'paying attention', 'trying hard' and 'good work' as the lessons progressed.

An unexpected finding from the qualitative data was the positive effect that team work had on the children's engagement with the project. Blatchford, Kutnick, and Bains (2007) found that primary school children who were taught using group work performed better in their Key Stage 2 assessment than their counterparts taught using traditional classroom methods. Blatchford et al. found that group work, delivered correctly, resulted in more engagement and a greater depth of thought. Observations of the group work in the current study show a similar effect, the teacher commented on the 'depth' of the discussions within the groups. It should be noted, however, that positive group work requires teacher support and time to develop. The class had previously received instruction, and had practice, in group work during their normal classes. If this foundation had not been laid, the need to work in groups may have inhibited learning during the current study. Unsupported group work can be threatening for some children and can result in them withdrawing their participation or misbehaving (Blatchford et al., 2007).

The children may have engaged with the project as they saw value in the knowledge that it was being trialled for the first time in their school. One possible future direction for the 'we are researchers' work would be to develop the programme so that teachers could run the projects in their schools with limited outside researcher involvement. If this approach were to be taken then it is possible that the children involved in subsequent projects would not feel as 'unique' and 'important' as the pupils felt in the current study, which could result in reduced enthusiasm.

Analysis of the qualitative data also showed that ownership and choice positively influenced motivation and engagement, which is in keeping with findings from previous research (Ames, 1992; Assor et al., 2005; Bucknall, 2010; GTC, 2009; Kellett, 2006). However, some children, particularly those of lower ability, can feel overwhelmed by unlimited choice and decision making needs to be supported to ensure that choice does not become a barrier to participation (Ames, 1992; Bucknall, 2010). In the current study the children and the teacher reported that pupils experienced difficulty in choosing a research question. Some scaffolding was used and 'school' was used as a focus for the children's choice and, whilst they did have difficulty in choosing a topic, it did not appear to act as a barrier in the current study.

The literature suggests that the provision of choice and self-directed learning can increase self esteem (Ames, 1992; Fielding & Bragg, 2003; GTC, 2009; Kellett, 2006). Interestingly, whilst the pupils in the focus group reported feeling more confident as a result of the project, the questionnaire revealed no significant difference in self efficacy items. The means for self efficacy items on both the baseline and project questionnaires were high, indicating that the children had a lot of confidence in their academic ability before and after they started the project. It is possible that no increase in self efficacy was observed because the children were already very confident before they started the project. Surprisingly, the reliability measures for the self efficacy items in the baseline questionnaire are considerably lower than those for the follow-up questionnaire. The wording of the self efficacy items was unchanged between the baseline and follow-up questionnaire so the improvement in reliability can not be attributed to different wording of the questions. It is possible that the children answered the self efficacy items inaccurately on the baseline questionnaire due to a lack of familiarity with such questionnaires. In support of the findings from the focus group, there was a slight increase in star ratings for 'good work' as the lessons progressed.

### 5.2.2 *Learner approach*

Items on the baseline and project questionnaires were intended to measure deep and surface approaches to learning, alongside self efficacy. However, reliability measures and a principal components analysis revealed that items on the baseline questionnaire and project questionnaire did not fit on the subscales as initially intended. The items designed to measure 'surface approach' presented a particular problem. Lower reliability for surface approach has been consistently observed in previous research (Biggs, Kember, & Leung, 2001; Kember et al., 2004), and Daly and Pinot de Moira (2010) found an element of multi-dimensionality within the surface approach subscale. Nevertheless, the reliability seen for surface approach items in the baseline questionnaire was considerably lower than seen in previous research. The first possible cause for the items not fitting comes from the children's lack of familiarity with reflecting on their learning styles and with completing questionnaires. This notion is supported in the Cronbach Alpha coefficients, which were considerably higher in the project questionnaire than the baseline questionnaire. It may be that at this later time, the children had gained some experience and practice in self-reflecting and self-reporting learner approach.

Secondly, the items were considerably re-worded from the original questionnaires in order to be accessible to the lowest ability 10 year-olds. The re-wording of items may have inadvertently changed their meaning. Additionally, in order to keep the questionnaires brief, only six items each were included for surface and deep approach, which may not have been adequate. It is impossible to draw firm conclusions over the validity of the items due to the small sample size and without further testing.

The third possible cause for the items not fitting the intended scales could be due to differences in learner experience at primary level. The original items came from questionnaires aimed at students in post-16 education and the majority of the learner approach literature has been focused on university students (Daly & Pinot de Moira, 2010). Appropriate items on surface approach in particular were difficult to find and adapt. The learner approach model acknowledges that the approach taken to study depends upon instructional practices, social factors, and the type of assessment (Brookhart et al., 2006). Post-16 education involves individual study outside of teaching time, high stakes assessment, and future goals such as university places, all of which may drive a surface approach to learning. Primary education does not have any of these elements. Whilst most of the research in learner approach has been focused on post-16 education, there is some evidence for the learner approach model applying to primary school children from a study conducted by Assor et al. (2005) with primary school

children in Israel. They found that teachers' controlling behaviours, such as restricting learning pace, excessive directives and suppressing the voicing of opinions, resulted in either a surface approach to learning or complete disengagement by students. On the other hand, supportive teaching behaviour, including providing choice, accepting criticism and allowing the child control of their pace of learning, resulted in a deeper engagement with learning. Surface approach may have different drivers and be in a slightly different form in English primary education. Whilst the surface approach items selected from post-16 questionnaires were the best fit to a primary school setting, they may still not have been meaningful to the pupils. This could explain why the surface approach items in particular did not function in the current study. If evaluation of learner approach in a primary context is to continue, measurement instruments will need to be further developed to ensure their effectiveness.

### 5.2.3 *Educational value*

The five additional items which related specifically to the project on the project questionnaire indicated that the children felt that they had learned new skills. Findings from the qualitative data indicated that both the teacher and the pupils felt the skills taught by the project were useful. The teaching programme was based on Kellett's (2005a) work and aimed to introduce the children to research skills and to develop the children's ability to think critically, plan and conduct their work independently, and to reflect on their findings and consider the limitations of their research. The teacher felt that the children learned useful and transferable skills from the project that were not covered in the Key Stage 2 curriculum and planned to run the project again during the next academic year. Kellett (2006) received similar feedback from interviews with the children who took part in her programme and their parents. Her participants reported that engagement with the research project had several learning benefits which included: development of transferable skills such as writing and organisation, sharpening of critical thinking skills, more effective communication and creativity, and independent learning (Kellett, 2006). It is unfortunate that the timing of the current study did not allow for performance measures to be compared before and after the project lessons, and future research would benefit from the inclusion of such performance measures.

## 6 CONCLUSION

Primary school children have questions and they are capable of conducting research which can inform the decisions that adults make on their behalf. The current pilot had methodological issues such as restricted time, implicit choice inhibition, and lack of feedback opportunities which need to be addressed in future projects in order to increase the impact of children's voice within their school. Nevertheless the current study has found that child-led research is a feasible approach to establishing children's views on their learner experience.

Pupils engaged positively with the project. Value, team work, ownership and choice, and teaching were factors which encouraged engagement. It was not possible to apply the learning approach model to the results from the questionnaire data. However, the results suggested that the children were interested and highly motivated in the project and significantly more engaged than they were before the project. The teacher and pupils reported that the project had educational value, and the teacher endorsed the project and planned to run it again during the next academic year.

Given that the design of the current pilot was non-experimental, it is not possible to draw conclusions as to whether this approach to teaching is any better or any worse than other approaches. The results from the study are nevertheless very encouraging. They suggest that 'children as researcher' projects can not only act as a vehicle for children's voice, but that they can also provide educational benefits for the children undertaking such research. Further work

is needed to explore whether other schools in other areas receive equal benefit and whether the benefits are sustained in future academic performance. The current pilot is a small step into the big world of child-led research.

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## 8 REFERENCES

- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261-271.
- Assor, A., Kaplan, H., Kanat-Maymon, Y., & Roth, G. (2005). Directly controlling teacher behaviors as predictors of poor motivation and engagement in girls and boys: The role of anger and anxiety. *Learning and Instruction, 15*, 397-413.
- Bell, A. (2007). Designing and testing questionnaires for children. *Journal of Research in Nursing, 12*(5), 461-470.
- Biggs, J. B. (1987a). *Learning process questionnaire manual*. Melbourne: Australian Council for Educational Research.
- Biggs, J. B. (1987b). *Student approaches to learning and studying*. Melbourne: Australian Council for Educational Research.
- Biggs, J., Kember, D., & Leung, D. Y. (2001). The revised two-factor Study Process Questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*(1/1), 133-149.
- Blatchford, P., Kutnick, P., & Bains, E. (2007). Pupil grouping for learning in classrooms: Results from the UK SPRinG study. In *International perspectives on effective groupwork: Theory, evidence and implications*. Presented at the American Educational Research Annual Meeting, Chicago. Retrieved from <http://www.tlrp.org/dspace/handle/123456789/1295>.
- Blumenfeld, P., Soloway, E., Marx, R., Krajcik, J., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist, 26*(3), 369-398.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.
- Brookhart, S. M., Walsh, J. M., & Zientarski, W. A. (2006). The dynamics of motivation and effort for classroom assessments in middle school science and social studies. *Applied Measurement in Education, 19*(2), 151-184.
- Bucknall, S. (2010). Children as researchers in English primary schools: Developing a model for good practice (pp. 1-17). Presented at the British Educational Research Association Annual Conference, University of Warwick.
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods, 4*(1), 62-83.
- Daly, A., & Pinot de Moira, A. (2010). Students' approaches to learning and their performance in the Extended Project pilot. *Curriculum Journal, 21*(2), 179-200.
- Fielding, M., & Bragg, S. (2003). *Students as researchers: Making a difference*. Cambridge, UK: Pearson.
- General Teaching Council. (2009). *Improving pupil learning through enhancing participation engaging with research* (pp. 1-74). General Teaching Council for England. Retrieved

- September 28, 2011, from [http://www.gtce.org.uk/documents/publicationpdfs/pupil\\_part\\_anthology1109.pdf](http://www.gtce.org.uk/documents/publicationpdfs/pupil_part_anthology1109.pdf).
- Jennifer, D. (2007). *Understanding bullying in primary school: Listening to children's voices*. Doctoral dissertation, University of Surrey. Retrieved October 6, 2011, from <http://epubs.surrey.ac.uk/652/>.
- Jennifer, D., & Cowie, H. (2009). Engaging children and young people actively in research. In K. Bryan (Ed.), *Communication in healthcare*, Interdisciplinary communication studies (Vol. 1), pp. 135-164. Bern, Switzerland: Peter Lang.
- Kellett, M. (2005a). Children as active researchers: A new research paradigm for the 21st century? ESRC. Retrieved from <http://oro.open.ac.uk/7539/1/MethodsReviewPaperNCRM%2D003.pdf>.
- Kellett, M. (2005b). *How to develop children as researchers: A step-by-step guide to teaching the research process*. London: Paul Chapman.
- Kellett, M. (2006). *Pupils as active researchers: Using engagement with research process to enhance creativity and thinking skills in 10-12 year-olds*. Presented at the British Educational Research Association Annual Conference, University of Warwick, UK. Retrieved October 2, 2011, from <http://www.leeds.ac.uk/educol/documents/160682.htm>.
- Kellett, M. (2009). Children as researchers: Issues, impact and contribution to knowledge. In *In: Counting children in!* Presented at the 2nd International Conference of Child Indicators, Sydney, Australia.
- Kember, D., Biggs, J., & Leung, D. Y. P. (2004). Examining the multidimensionality of approaches to learning through the development of a revised version of the Learning Process Questionnaire. *British Journal of Educational Psychology*, 74(2), 261-279.
- Kitzinger, J. (1994). The methodology of focus groups: The importance of interactions between research participants. *Sociology of Health and Illness*, 16, 103-121.
- Kucharski, G. A., Rust, J. O., & Ring, T. R. (2005). Evaluation of the ecological, futures, and global (EFG) Curriculum: A project based approach. *Education*, 125(4), 652.
- Liu, W., Wang, C., Tan, O., Ee, J., & Koh, C. (2009). Understanding students' motivation in project work: A 2 x 2 achievement goal approach. *The British Journal of Educational Psychology*, 79, 87-106.
- Marsh, H. W., Craven, R. G., Hinkley, J. W., & Debus, R. L. (2003). Evaluation of the Big-Two-Factor Theory of academic motivation orientations: An evaluation of jingle-jangle fallacies. *Multivariate Behavioral Research*, 38(2), 189-224.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4<sup>th</sup> ed.). Needham Heights, MA: Allyn & Bacon.
- UNICEF. (2009). *Summary of the United Nations Convention on the Rights of the Child*. UNICEF. Retrieved September 29, 2011, from <http://www.unicef.org.uk/Latest/Publications/Summary-of-the-United-Nations-Convention-on-the-Rights-of-the-Child/>.
- Yamzon, A. (1999). *An examination of the relationship between student choice in project-based learning and achievement*. Retrieved October 6, 2011, from <http://www.eric.ed.gov>.



## Appendix 1 lesson plans

'We are researchers' project



Lesson schedule

Monday 6<sup>th</sup> June                      Session 1: Introduce research & idea formation

Monday 13<sup>th</sup> June                      Session 2: Research methods

Wednesday 22<sup>nd</sup> June                      Session 3: Planning & material design

Thursday 30<sup>th</sup> June                      Session 4: Data entry & analysis

Monday 11<sup>th</sup> July                      Session 5: Presentations

Dissemination:

The children will give their presentations at a school assembly (at the school's discretion).

Appendix 2 Star ratings: instructions, consent form, and example



**Research Diary 4 Star Ratings**

Ms Spalding is from AQA's Centre for Education Research and Policy. She is conducting her own study on how a doing a research project might help children learn. As part of her research she would like to know how you found working on your project.

She would like you to fill out the four star ratings at the end of each class to find out what you thought of the lesson. Your four star ratings will only be used for Ms Spalding's research. Your teachers and friends will not be shown your research diaries. Ms Spalding will make sure that for her research all of the ratings will be confidential; no-one else will know what you have said.

You do not have to fill out the four star ratings. If you do fill out the ratings but decide at the end of the project that you do not want them to be used as part of Ms Spalding's research, you do not have to hand in your research diary.

If you are happy for your four star rating to be used in Ms Spalding's research then please sign the consent form.

**Four Star Ratings Consent Form**

Please circle  or 

	Yes	No
Have you had enough information about the 4 star ratings?		
Have you had the chance to ask any questions?		
Do you understand that doing the 4 star ratings is up to you and that you are free to not fill them out without having to give a reason?		
Do you understand that anything you say is confidential –no-one else will know what you have said?		
Do you agree to take part in this research?		

Name: .....

Signature: .....

Date: .....

**Thank you very much for your time**

### 4 Star Ratings

At the end of each lesson you will need to give stars for the lesson and for yourself.

Give your ratings by colouring in the stars.

Not at all	=	★☆☆☆☆
A little	=	★★☆☆☆
Some	=	★★★☆☆
Mostly	=	★★★★☆
Very	=	★★★★★

### The lesson 4 star rating

You will need to give the lesson stars for;

- how fun you found it,
- how interesting you thought it was and
- how clear it was (easy to understand what you were meant to be doing).

Take Rachelle for example:

### Rachelle's 4 star rating

★☆☆☆☆	Fun
★★★☆☆	Interesting
★★★★☆	Clear

You should be honest about how you feel. It's OK to not have the same thing as your friend, your feelings might be different.



### My 4 star rating

You will need to rate yourself for;

- how much you paid attention,
- how hard you tried and,
- how good your work was.

Take Ben for example:

### Ben's 4 star rating

★★★☆☆	Paying attention
★★☆☆☆	Trying hard
★★★☆☆	Doing good work



You should be honest about how you did. You will not be told off if you don't give yourself many or any stars.

Each week you give your stars in the box that looks like this

### The lesson 4 star rating

☆☆☆☆	Fun
☆☆☆☆	Interesting
☆☆☆☆	Clear

### My 4 star rating

☆☆☆☆	Paying attention
☆☆☆☆	Trying hard
☆☆☆☆	Doing good work

**Appendix 3 Baseline Questionnaire: items, Cronbach Alpha, item correlations, mean response (out of 4) & SD**

Item	<i>Self Efficacy</i> ( $\alpha = 0.69$ )	Correlation Matrix					mean	SD	
		2	3						
1	I can do difficult tasks	0.29	0.50*				3.48	0.69	
2	I believe I can do any school work if I really try hard		0.48*				3.07	0.70	
3	I am confident that I can do many different tasks well	0.50*					3.24	0.69	
	<b><i>Deep Approach</i></b> ( $\alpha = 0.81$ )	<b>6</b>	<b>8</b>	<b>11</b>	<b>13</b>	<b>14</b>	<b>mean</b>	<b>SD</b>	
4	I do my school work because I like learning new things	0.52*	0.45*	0.50*	-0.17	0.47*	2.90	0.86	
6	I like to try to find ways to link topics together		0.71*	0.51*	0.12	0.65*	2.83	0.76	
8	I find most topics interesting and like to find out more about them	0.71*		0.52*	0.21	0.60*	2.90	0.90	
11	I work hard at school because I find the topics interesting	0.51*	0.52*		0.13	0.56*	2.48	0.87	
13	<i>I am only happy once I really understand the topic we are learning in class**</i>	0.12	0.21	0.13		0.72	3.14	0.64	
14	I do my school work because I enjoy figuring things out	0.65*	0.60*	0.56*	0.72		2.48	0.83	
	<b><i>Surface Approach</i></b> ( $\alpha = 0.13$ )	<b>7</b>	<b>9</b>	<b>10</b>	<b>12</b>	<b>15</b>	<b>mean</b>	<b>SD</b>	
5	<i>I do my school work because I want my teacher to be pleased with me</i>	0.15	-0.39*	0.25	0.01	0.23	3.17	0.76	
7	<i>I find it better to just learn the facts about a topic rather than try to understand all about it</i>		-0.15	0.31	0.35	0.42*	2.28	1.07	
9	<i>I only do the work that is needed for class as I think I don't need to do anything extra</i>	-0.15		0.00	0.20	-0.23	2.55	1.18	
10	<i>I feel most successful in school when I am top of the class</i>	0.31	0.00		-0.02	0.15	2.86	1.11	
12	<i>I like topics where I just have to learn facts better than topics which need a lot of understanding</i>	0.35	0.20	-0.04		-0.18	2.97	0.98	
15	<i>I will try for top marks in class whether or not I like the topic we are learning</i>	0.42*	-0.23	0.15	-0.18		3.31	0.93	
	<b><i>Engagement</i></b> ( $\alpha = 0.81$ )	<b>17</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>11</b>	<b>14</b>	<b>mean</b>	<b>SD</b>
16	I enjoy studying at school	0.71*	0.75*	0.52*	0.64*	0.45*	0.52*	2.59	0.98
17	I try hard in lessons		0.70*	0.53*	0.50*	0.49*	0.39*	3.45	0.74

Note: \* $p = 0.05$  level (2-tailed). Italicised items were removed from the final analysis after a principal component analysis revealed that they did not fit the intended scales.

## Appendix 4 Project Questionnaire: items, Cronbach Alpha, item correlations, mean response (out of 4) &amp; SD

Item	<b>Self Efficacy (<math>\alpha = 0.88</math>)</b>	Correlation Matrix					mean	SD	
		2	3						
1	I can do difficult tasks	0.68*	0.73*				3.07	0.88	
2	I believe I can do any school work if I really try hard		0.73*				3.10	0.82	
3	I am confident that I can do many different tasks well	0.73*					3.21	0.86	
	<b>Deep Approach (<math>\alpha = 0.81</math>)</b>	<b>6</b>	<b>8</b>	<b>11</b>	<b>13</b>	<b>14</b>	<b>mean</b>	<b>SD</b>	
4	I liked learning new things on my project	0.58*	0.33	0.43*	0.25	0.60*	3.17	0.89	
6	I liked trying to find ways to link topics together on my project		0.45*	0.16	0.42*	0.63*	2.79	0.92	
8	I found my research topic interesting and liked finding out more about it	0.45*		0.46*	0.49*	0.62*	3.24	0.83	
11	I worked hard on my project because I found it interesting	0.16	0.46*		0.10	0.31	2.93	0.88	
13	<i>I was only happy once I really understood the topic I was researching for my project</i>	0.42*	0.49*	0.10		0.65*	3.10	0.90	
14	I enjoyed figuring things out while working on my project	0.63*	0.62*	0.31	0.65*		3.07	0.81	
	<b>Surface Approach (<math>\alpha = 0.73</math>)</b>	<b>7</b>	<b>9</b>	<b>10</b>	<b>12</b>		<b>mean</b>	<b>SD</b>	
5	<i>I do my project work because I wanted my teacher to be pleased with me</i>	0.24	0.22	0.37	0.17		2.37	0.97	
7	<i>I found it better to just learn the facts about my project rather than try to understand all about it</i>		0.50*	0.20	0.73*		2.59	1.15	
9	<i>I only did the work that was needed for my project as I don't think I need to do anything extra</i>	0.50*		0.24	0.58*		2.63	0.84	
10	<i>I feel most successful in my project when I was top of the class</i>	0.20	0.24		0.41*		2.52	0.95	
12	<i>I liked project lessons where I just have to learn facts better than lessons which needed a lot of understanding</i>	0.73*	0.58*	0.41*			2.72	0.92	
	<b>Engagement (<math>\alpha = 0.81</math>)</b>	<b>16</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>11</b>	<b>14</b>	<b>mean</b>	<b>S.D.</b>
15	I enjoyed working on my project	0.71*	0.54*	0.52*	0.76*	0.56*	0.60*	3.34	0.77
16	I tried hard in my project lessons		0.42*	0.49*	0.70*	0.51*	0.55*	3.54	0.58
	<b>Project</b>						<b>mean</b>	<b>SD</b>	
17	I have learned things from my project that I would not have learned otherwise						3.36	0.78	
18	The project was harder than my normal lessons						2.59	1.02	
19	I did not gain new skills by working on my project						1.96	0.88	
20	I enjoyed doing the presentation						3.44	0.70	
21	I enjoyed writing my research diary						2.76	0.74	

Note: \* $p = 0.05$  level (2-tailed). Italicised items were removed from the final analysis after a principal component analysis revealed that they did not fit the intended scales.

## **Appendix 5 Children's focus group schedule**

Ice breaker: What was your project on?

### **Engagement/Enjoyment: did the pupils enjoy the project and did they actively engage in the activities**

- Q1. Did you enjoy the project lessons? If yes why? If no why?
- Q2. What did you think was good about the project? What made that good?
- Q3. What did you think was bad about the project? What made that bad?
- Q4. Did you find the project difficult? If yes why? If no why?
- Q5. Do you think you have learned new skills? What are they?
- Q6. How important was the project to you?
- Q7. Did you look forward to the project lessons?
- Q8. Were the project lessons very different to normal lessons?
- Q9. Would you want to do a similar project again?

### **Control/Ownership: did the pupils feel like they were in control of the project and that the project was theirs?**

- Q1. How much choice did you get on your project?
- Q2. Did you research a topic that you wanted to?
- Q3. If it was completely up to you what topic would you have researched?
- Q4. Did the project feel like your own? If yes, why? If no, why not?
- Q5. Did you feel in control of your project?
- Q6. Do you feel proud of your work?

### **Assistance: the role of the teacher and the teacher pupil relationship**

- Q1. How much did the teacher help? Was this too much? Too little?
- Q2. Did you understand everything that you were meant to be doing?
- Q3. Did you feel like you could ask the teacher questions and tell them what you thought?
- Q4. Did you feel like the teacher was listening to your ideas?
- Q5. Could the teachers have done anything differently?

### **Group work: how working in groups affected the pupils**

- Q1. Did you enjoy working in groups? If yes, why? If no, why?
- Q2. What was good about working in groups?
- Q3. What was bad about working in groups?
- Q4. Do you think that you were able to manage tasks well as a group?
- Q5. Were your group friends?
- Q6. Would you have preferred to work in pairs?
- Q7. Would you have preferred to work on your own?

### **Improvements: what would have made the project better?**

- Q1. What was your favourite activity?
- Q2. What would you change about the project lessons and why?
- Q3. What would have made the project better?

## **Appendix 6 Teacher interview**

### **Content/Skills taught: Does the content of the project lessons have educational value?**

- Q1. Did the project lesson benefit the children? Prompt: In what way?
- Q2. Do you feel that the children have learned from the experience? Prompt: What was the most valuable skill that children acquired as a result of the project?
- Q3. Did you feel that some of the content did not benefit children? If so what?
- Q4. Do you feel that some aspects of the project should have had a greater emphasis?
- Q5. Did the children acquire skills that are not covered in the KS2 curriculum?
- Q6. Did the project add to the children's education?

### **Learner outcomes/learner approach: did the project encourage deep learner approach, were the children engaged and motivated, and how accessible was it for learners?**

- Q1. Did the project challenge the children to think deeply about their research area?
- Q2. Was the project accessible to all the children? Was the project at the appropriate level of demand?
- Q3. Did a particular ability range benefit more than others?
- Q4. Did any pupil perform unexpectedly well during the project? If yes why do you think that was?
- Q5. Did any pupil perform unexpectedly poorly during the project? If yes why do you think that was?
- Q6. Were the pupils more motivated than in their normal lessons?
- Q7. Were the pupils more engaged than in their normal lessons?
- Q8. Do you feel that giving children the choice about what they do will increase their motivation?

### **Ownership: did the pupils feel like the project was 'theirs'?**

- Q1. Do you think the children felt like the project was 'theirs'?
- Q2. Is there anything that we could have done differently which would have increased the children's ownership of the project?
- Q3. Do you think that working in groups may have resulted in some children feeling that they had less of a say in the project?

### **Practicalities and future improvements: how can research projects like this pilot be run effectively in schools?**

- Q1. Did the children working in groups work well? Do you think that it would have been better if fewer children did individual projects outside of school time?
- Q2. How long do you think is needed to run a research project like this effectively?
- Q3. How much teacher support would be needed to run a research project like this again in your school?
- Q4. Would it be possible to run a research project like this without outside help (one teacher one TA)? If so, how would you go about organising it?
- Q5. Given the choice, would you run a similar project next year?
- Q6. What improvements would you suggest for the project?

### **Appendix 7 Research questions**

How different people react to fall outs?  
What do you do when you fall out with your friends and how do you feel?  
How sports affect people lives?  
What sports are favoured by boys and girls?  
Why you do that sport?  
Why they do art differently in secondary school?  
What types of art do we look at?  
What art resources are used during the lessons?  
Any particular countries we help?  
How the pupils get involved in charity?  
The average of money we raise for charity?  
What charities do we like?  
What do we like to do to raise money?  
Is it compulsory for the school to teach sport?  
Why do we go swimming only every other year?  
Why do we only have two lessons associated with sport?  
What sport do pupils prefer?  
What is fun about the computer and ICT and why?  
What are people favourite websites and why?  
Do you prefer researching in a book or on the computer?  
What is people favourite part of P.E. and why?  
How PE helps us keep healthy?  
Does PE make you feel healthier?  
How the children spend the lunch-time and why?  
Do the children enjoy lunchtime?  
What is the most popular lunchtime game?  
What do the children like better; the field of the playground?  
What is in school dinners?  
How many people have school dinners?  
What is the purpose of clubs?  
What clubs do people enjoy?  
How many different types of sport there is?  
Are there any sports we don't know about?  
How many different ways can you create art?  
What makes a good piece of art?  
How many people do art?  
How many people enjoy art?  
If people levels are higher in sports of academic studies?  
Whether you should do sport first thing in the morning?  
What do you enjoy about sport?  
What do you enjoy about academic?  
Canteen style food?  
Friends sit together? (lunchtime)  
Different classrooms for different games? (lunchtime)  
What teachers think of the rules?  
Should we take away some of the rules?



## Appendix 8 An example of the children’s presentation slides



### What gender does more sports?

By Abbie, Chloe, Molly, Max & Toby

### Introduction: Why we chose this topic

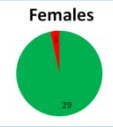
- Our topic is sports .
- We chose this topic because we thought we could get a lot of information out of it.
- Our research question: what gender does more sports?

### Method: How we collected our data

- Our research method was a questionnaire
- We designed questionnaires and consent forms and then handed them out to 58 year 4 pupils.
- We learnt about ethics and how in our questionnaire no names would be mentioned. We made a consent form to see if they were happy for themselves to participate.

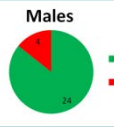
### Do you participate in sports?

#### Females



29

#### Males



24

What do these graphs show?  
The year 4 females participate in more sports than males.

### What is the average number of sports people play?

	Average number of sport played by a person
Females	2.87
Males	2.57
Everyone	2.72

This graph shows that there isn't a significant difference between the average amount of sports played by a male or female.

Three most common sports played by each gender			
Females		Males	
Sport	%	Sport	%
Swimming	57%	Football	57%
Dancing	47%	Cricket	39%
Gym	37%	Swimming	39%

### Are there any sports you don't play but want to try?

#### Females



74

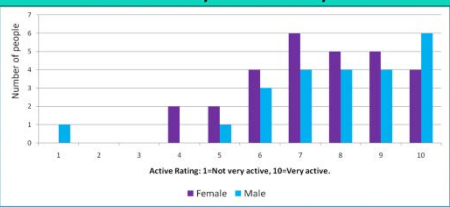
#### Males



17

This graph shows that more females want to try new sports compared to males.

### How active do you think you are?



This graph shows that males think they're more active than females.

	Average active rating
Females	7.46
Males	8.13
Everyone	7.76

### Limitations

- What did not work? The sample size we would have preferred it if there was a bigger variety throughout the years.
- What questions could you have re-worded to make clearer? The one asking what sports you watch/play into write one of your favourite sports to watch and play
- What would you change if you did this again? We would spread the questionnaire across the years.

### Conclusion

- We found out that in year 4 Females participate in more sports than the males.
- Males in year 4 believe that they are more active than females, however we can prove that it is only opinions, as in our results females play a larger amount of sports than males.

### Thank you

We would like to thank miss Spalding first for organising and a thank you to miss Platten for helping with our planning and questionnaire.

**Appendix 9 Star ratings: mean response (out of 4) and S.D**

Lesson	Fun		Interesting		Clear		Paying Attention		Trying Hard		Good Work	
	mean	Sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
Week 1: Introduction, ethics and ideas	2.71	0.77	2.74	0.82	3.31	1.04	3.15	0.75	2.74	0.95	2.87	0.88
Week 2: Research methods	2.63	0.63	2.89	0.89	3.00	0.88	3.00	0.83	3.04	0.81	2.96	0.76
Week 3: Planning and material design*	2.68	0.86	2.39	0.99	2.96	0.88	2.93	0.94	3.00	0.77	3.39	0.74
Week 4: Data analysis*	3.19	0.96	2.85	1.03	2.93	0.83	3.41	0.57	3.30	0.72	3.33	1.04
Week 5: Presentations	3.19	0.80	2.85	0.93	3.32	0.80	3.24	0.78	3.16	0.80	3.32	0.63
<b>Overall</b>	<b>2.85</b>	<b>0.54</b>	<b>2.74</b>	<b>0.64</b>	<b>3.14</b>	<b>0.57</b>	<b>3.15</b>	<b>0.52</b>	<b>3.00</b>	<b>0.52</b>	<b>3.12</b>	<b>0.53</b>

\*retrospective ratings.