Exploring greenspace through a different lens: Children as researchers

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Abstract

This paper reports research on the use of greenspace carried out by Primary school students with the support of a social scientist. The aim of the interdisciplinary learning experiment was to introduce pupils to social science methods and to enable them to carry out a survey on a topic of their choice. The findings provide insights into (i) the perceptions of pupils on the provision and use of greenspace in their local town, and (ii) resulting benefits if this kind of knowledge exchange was used more commonly. We also highlight challenges of involving pupils in social research.

1 Introduction

Research involving children – in its broadest sense – is not new. The majority of this body of research, however, can be labelled as 'research on children'. This type of research focuses on issues relating to childhood, children's experiences and viewpoints, while treating children as research 'objects' in projects designed and conducted by adults. A second type of research can be distinguished where research is carried out 'with children'. Studies of this type include children and young people as co-researchers. Whilst both types are participatory, they are still prescribed from above (Franks, 2011). Much less common is a third type, which covers research that is undertaken by children themselves, and literature about this type of research is much scarcer. In addition to these three types, there is research in schools which overlaps with learning, the main occupation for everyone at school. According to Alderson (2008, 279), this wealth of research in schools "is almost entirely unpublished, and tends to be seen as 'practicing' rather than as worthwhile in its own right." The type of research described in this paper sits somewhere along the continuum between adult-designed/ influenced and truly children-led. This is because the research was designed and led by children who have also been trained by adults.

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But why is it important that children are able to do research themselves? Children see the world through different eyes and hence ask different questions and have different concerns (Kellett, 2005). We agree with Christensen and James (2000) in that children's views are just as valid as adults', and that children can speak 'in their own right'. Experience has shown that 10-11 year olds are capable to carry out their own research if taught the skills to do so (Kellett et al., 2004). Franks (2011) suggests that young researchers can contribute valuable cultural knowledge, linguistic and other forms of knowledge that the adult researcher may lack. The issue here is whether adults are willing to acknowledge the results produced by children researchers as valid research.

Kellett (2005) made a major contribution to empowering children to do social research by designing a programme that allows to children to learn about the necessary tools in the course of some ten weeks. Subsequently, they are able to design their own research questions, devise tools for data collection and analyse the data. This is important because children not only ask different questions than adults to start with, they might also go about finding answers to those questions in a different way. Alderson (2008, 279) speculates that "children are possibly more likely than adults to be interested in every stage of research." Viewpoints of children might go unnoticed if only adults conduct the research, even when they fully immerse themselves.

Why should (also) children research environmental topics, for example greenspace? Firstly, we (as adults) may learn things that we did not expect. Children have different perceptions to adults, and priorities and perceptions differ between children's age groups. Primary school children, in particular at age 6-11 have the greatest interest in exploring and understanding of natural environment (Sobel, 1993; Stanley, 2011). These authors report on a distinct trend found in the behaviour pattern of children in their preference of play. "At around 11 years of age, many children gradually moved out of the woods setting and into more standard playground or field areas, where they interacted in larger peer groups" (Stanley, 2011, 195). We derive that children in a Primary 6 (P6) class will therefore have a different perception of and demands on greenspace than teenagers and adults (Kellett, 2005). This underlines the importance of enabling children not just be co-researchers but also for adults to accept children's research questions and research design.

Secondly, children may learn things that they did not expect. By introducing children to concepts, methods and tools which they can apply directly or link immediately to reality there is a greater chance for sustainable learning. As the Chinese philosopher Confucius (450 B.C.) said: *Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand.* If children have the chance to learn by discovering something themselves, it is more likely to remain with them and influence how they think and what they do.

And thirdly, it may impact greatly on society's future. A major benefit of involving children in research on greenspace is that it provides opportunities for fostering the link between children and their natural environment to make them appreciate and protect it in the future. Society's continued existence and ability to thrive depends on our ability to use natural resources sustainably, and to enable and teach our children to do the same. The basis for this is a personal appreciation and valuation of the environment (Chawla, 1999; Fisman, 2005). Children need to understand this, feel responsible and feel an innate duty of care and limit their use of natural resources. Stanley (2011, 187) emphasised the importance of "the ways in which children encounter environmental elements

(…) and how these experiences contribute to a developing and lasting sense of place" along with caring and feeling responsible. For example, a 13 year-old says about the woods that are part of the recess area at his school "I don't really play there anymore but I still love it" (ibid., 201). In addition, there is evidence for the connection of play to environmental learning (Lester & Maudsley, 2006; Tovey, 2007).

One way to foster children's understanding and appreciation for their natural environment is the early opportunity to experience and interact with the natural environment which, especially for children in urban contexts, will often take place in green spaces around the town. Greenspace provision and opportunities for exploring it are important for two reasons: 1) the trend that children likely spend most of their time at home indoors (Tovey, 2007), and 2) the trend that outdoor free play in school has seen a dramatic decline in recent years (Frost, 2006). Most schools do not provide opportunities for children to explore or learn from natural landscapes since they often lack the physical landscape to provide such opportunities. Hence the provision of greenspace and also an understanding of childrens' perception of greenspace are required.

In the context of teaching children research skills, and children researching their use of greenspace, the aim of this paper is twofold:

1. To show how teaching research skills to primary school children can enhance their own as well as adult understanding of a particular topic of interest and importance to them; and
2. To illustrate one example of how the limited time and resources of researchers and teachers can be used effectively to teach research skills (in cases where the more elaborate approach by Kellett is not feasible), by reporting on one way of structuring this interaction.

Ultimately, the purpose of this paper is to encourage more researchers to interact with schools, if possible regularly, and to encourage teachers and students to demand this involvement in order to improve the link between research and practice ("the real world").

2 Methodology

An interdisciplinary learning experiment was designed with Buchanhaven Primary School in Peterhead (Scotland, UK) and the authors as part of the school's science week. The main purpose was to help primary students learn about social science, in particular the method of quantitative survey by using a questionnaire. The aim was for the children not just to be co-researchers but to enable them to carry out the research themselves. The first visit took place in March 2011, the second in September 2011. Both visits were structured in a similar way with a three hour time slot available for each visit.

The classes chose greenspace as an area of interest in discussion with their teacher, prior to the visit of the researcher. The session started off with a discussion of what greenspace meant. Students understood greenspace as an area of greenery within towns which includes public parks, gardens, football pitches, woodlands, or green strips along waterways. Some children also suggested farm fields and meadows. During the discussion, the students were made aware of the difference between public greenspace, which is available for everybody, and greenspace that can only be used by certain people, such as allotments and golf courses.

The research question the students wanted to answer was: "How do primary school students in Peterhead use greenspace?" The class was supported in drafting the questions for the standardised questionnaire and asked to come up with answer options (Table1). As limited time was available for the analysis the number of questions was limited to five.

Table 1: **Questionnaires used in the surveys**

Survey March 2011	Survey September 2011
1. **Is there enough greenspace in Peterhead**? □ Yes □ no □ don't know	**Do you use greenspace in the town of Peterhead?** □ Yes □ no □ don't know
2. **What do you use greenspace for**? □ Football □ Planting/growing veg □ Rugby/ walking □ Easter egg hunt □ Other……	**If you use greenspace how often do you use it?** □ Every Day □ Once a week □ Once a month □ Hardly ever
3**. How far would you cycle to a greenspace**? □ 5 minutes □ 10 minutes □ 15 minutes □ More than 15 minutes	**What do you use green space for?** □ Playing □ Camping □ Bike racing □ Horse riding □ Sports day □ Gardening / growing plants □ Walking the dog □ BBQs □ Other……..
4. **How far would you walk to a greenspace?** □ 5 minutes □ 10 minutes □ 15 minutes □ More than 15 minutes	**Why do you think we need to have greenspace in town?** □ To keep healthy □ To graze sheep / cattle □ To get exercise □ Space to relax □ Other……
5. **Are you** male □ female □	**Are you** □ Male □ Female

A total of 108 responses were collected. The questions of the March survey were answered by 51 students (23 girls, 28 boys) from two P6 classes. The September survey was completed by 57 students (29 girls, 28 boys) of a P5 and a P6 class.

The analysis varied between the March survey and the September survey. For the March survey, the data were collected in class and entered into an Excel spreadsheet. Charts were created and discussed among students with the researcher asking questions about the charts and about why the results may be as they are. Following the visit a report was written which was sent to the class teacher for distribution among students, teachers and parents (Prager, 2011). The September survey was analysed with the class in a similar way. A third visit also covered a three hour slot of the school day. The focus was on teaching the children how a research report is structured, how absolute numbers are converted into percentages, and how graphs can be created by hand. Additional time

was spent on helping the children interpret the data they had gathered in the surveys. After the third visit, the researchers combined the results of both surveys (March and September 2011) (Prager & Heide, 2012).

3 Results and Discussion

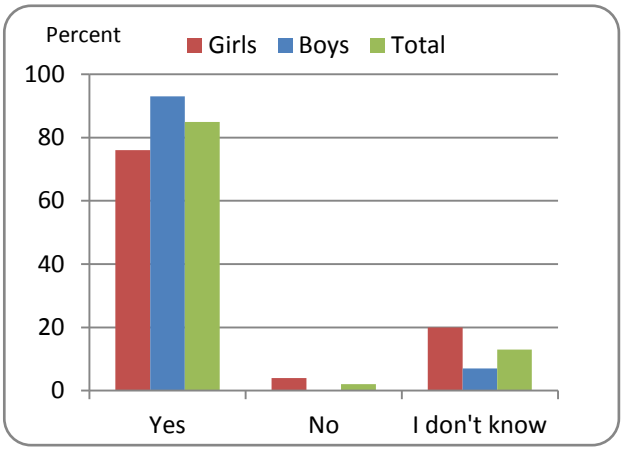
3.1 Survey Results

The results provide information on availability, accessibility and use of public greenspace in Peterhead and the reasons for having greenspace in town. Due to space limitations only some results will be highlighted. Detailed results are provided in the two reports prepared for the school (Prager, 2011; Prager & Heide, 2012).

Frequency of greenspace usage in Peterhead

Around 85% of the 57 P6 students (March group) stated that they make use of the greenspace in Peterhead. More boys visit greenspace (93%) than girls (76%) (Figure 1). More than half of the students, surveyed in September, use greenspace every day and a quarter of the 57 students, once per week. Of those 33 students visiting greenspace every day, 58% are boys. Almost half of the girls use greenspace every day and nearly a third of them once per week. Only four students (7% of the group) stated that they hardly ever visit greenspace.

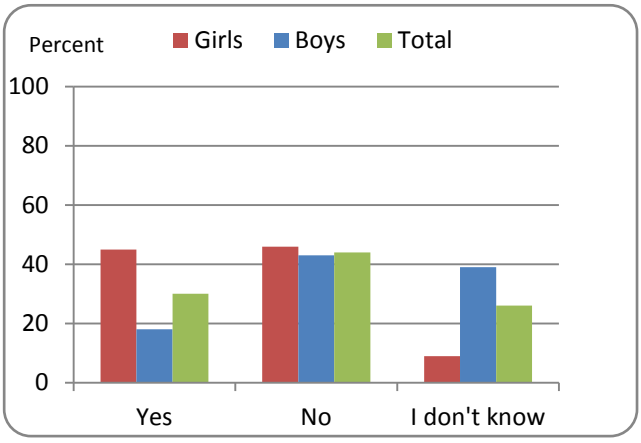
Figure 1: Do P5/P6 students use greenspace in Peterhead?



Availability of greenspace in Peterhead

In total, 43% of respondents to the March survey felt there was not enough greenspace in Peterhead, while 30% answered that Peterhead offers a sufficient amount of greenspace. 13 out of 49 students (two missing answers) stated they did not know (11 boys) (Figure 2).

Figure 2: Is there enough greenspace in Peterhead?



What children use greenspace for

The question what greenspace is used for was the only question asked in both surveys. Note that the two groups came up with different answer options while designing their questionnaire (Table 1). The number of times each use was mentioned was added up and the sums are represented in Figure 3. In the March survey, Football is the most common use of greenspace, with 24 out of 51 students listing this activity, followed by Planting/growing vegetables. While boys

prefer to use greenspace for football, girls prefer the planting activity. Ten respondents said that they use greenspace for an Easter egg hunt. Other uses include Playing, Horse riding and Gymnastics'.

Figure 3: What do P6 students use greenspace for? (Count, March survey)

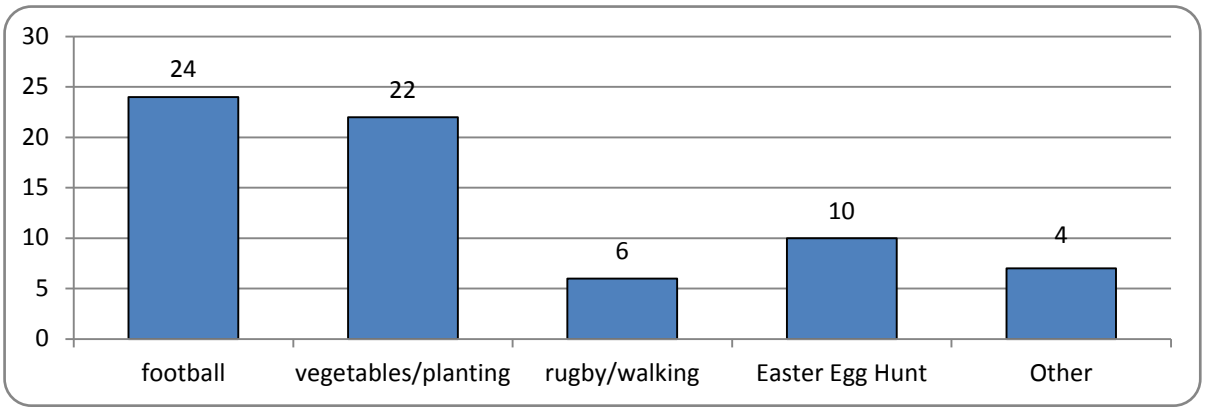


Figure 4: What do P5/P6 students use greenspace for? (Count, September survey)

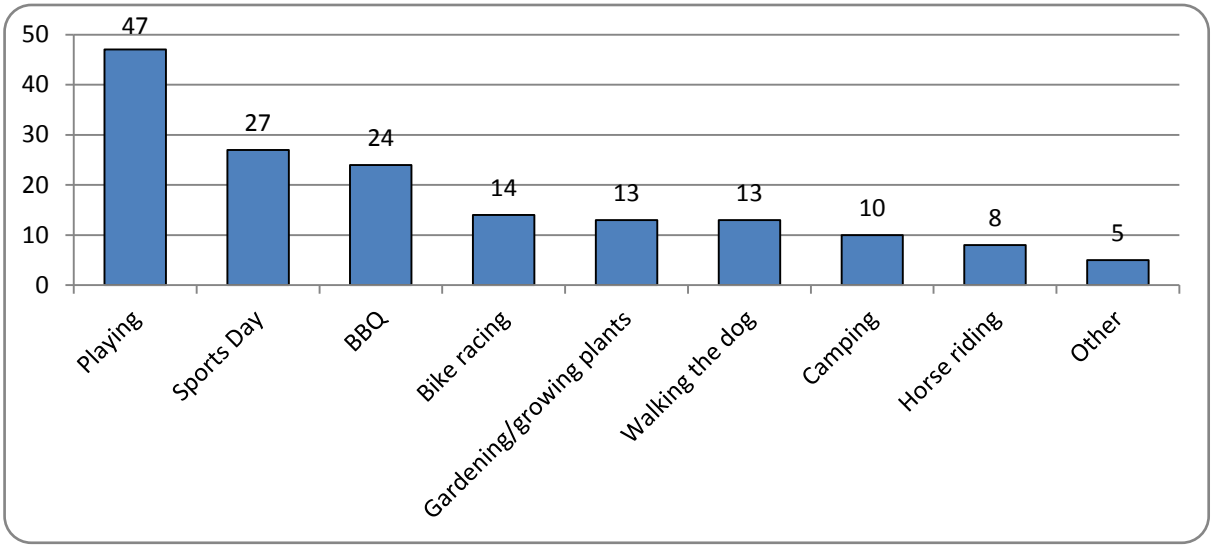


Figure 4 shows the responses of the second survey (September) to the same question. Over 80% (47) of the students say they use greenspace for playing (75% of boys, 90% of girls). The second most popular use, Sports Day, is also enjoyed by girls and boys alike (chosen by 47%, 27). Male students prefer BBQs and bike racing. Slightly fewer boys (21%) than girls (24%) use greenspace for Gardening/growing plants (in total listed by 13 students). The only Other use suggested was Running.

3.2 Discussion

This discussion of results is mainly based on thinking and interpretation by the researchers. The three hour space in class was not nearly sufficient to allow for analysis, discussion, and interpretation of the results to be completed by the students alone. Initial steps in the analysis and visualisation were

undertaken by the students, followed by some discussion of findings in class among students, the teacher, and the researchers.

The majority of primary school children in P5 and P6 used greenspace in Peterhead. 85% of the students in the September survey claimed they use greenspace – especially boys "because [they] like to play football and girls don't" explained Melissa, one of the students. Furthermore, the majority of the students claimed to use greenspaces every day, in particular boys (67%). Consequently, greenspaces are a valued asset and a worthwhile investment from the viewpoint of the children.

Despite the effort the students were willing to make in order to reach greenspace (e.g. by cycling or walking for more than 10 minutes), the majority of students (March survey) felt that there is an insufficient amount of greenspace in Peterhead, in particular boys. This can be interpreted as demand for more such spaces. 25% of students stated they did not know whether greenspace provision in Peterhead is sufficient or not. Possible explanation for this figure could be that they either did not feel competent to give their statement for the entire town, or that they had not previously given the matter much thought. According to a student, another explanation could be that some pupils did not fully grasp the meaning and concept of greenspace (voiced while discussing the figures in class). All explanations imply that more could be done to raise students' awareness of greenspaces and their town in general.

Some of the most popular activities of the students in the September group was not even mentioned by the students of the March group. Similarly, 'Growing vegetables/ plants' was ranked second in the March survey but only 5th in the September survey. The figures demonstrate how much the options themselves as well as their choices are influenced by situation and the context, e.g. the 'Easter Egg Hunt' in a questionnaire designed just before the Easter holidays.

Limitations of the study

The findings on greenspace in themselves are limited by the character of the study as an interdisciplinary learning experiment. It was designed to help children learn about research at the same time as generating data. Mistakes were allowed because we saw them as useful for the learning experience. For example, the answer option 'Rugby/Walking' (March survey) should have been split but because it was a pupil who wrote the answer options into a word document as they were being suggested by the class, and limited time for checking the questionnaire, this mistake was not detected until the survey was conducted. However, the students noticed this themselves and we discussed what the consequences were for the data this survey had generated.

The sample population could have been increased by asking the September group to use exactly the same questions and answer options. However, in that case the class would have missed out on the learning effect. The class unanimously decided they were happy to investigate the same topic and research question but wanted to design their own questionnaire. Errors in the questionnaire design might have influenced the responses. For example, it was not specified if one or several boxes could be ticked for 'use of greenspace' which may have led some students to select only one even if they used greenspace for different types of activities.

Time restrictions did not allow to have detailed discussions with the students about some of the results and what they might mean. For example, 45% of children said they plant or grow vegetables in greenspaces – this could mean that many of them included allotments in their definition of greenspace or referred to their own backyard.

4 Conclusion

4.1 Use of greenspace from the perspective of children

The findings of the two surveys revealed that greenspaces in Peterhead are a worthwhile investment from the viewpoint of children since almost all respondents used greenspaces and the majority enjoyed them on a daily basis. Nevertheless, the majority thought the amount of greenspace in Peterhead was not sufficient. Children used greenspace mainly for playing, in the case of boys especially playing football.

The kind of data generated cannot replace empirical studies, partially due to limitations in design and data collection related to the study's main purpose of enabling hands-on learning about social sciences, and the time restrictions. For example, the needs expressed by the children varied considerably between the two surveys due to the differing answer options in the questionnaires. Empirical results reflect only the perceptions and needs of one age group (10-11 years) so generalisation to e.g. all primary schools in Peterhead is not possible. If results were to inform planning for the provision of greenspace, students of all ages from both primary and secondary school would need to be surveyed.

Nevertheless, the findings can be used to share the students' insights with other students, teachers, or parents. In addition, the results might be of interest to the local authority or other organisations involved in town planning, well-being and health, and could benefit town planning endeavours that consider children's perspectives.

4.2 Teaching research skills to children

We identified both benefits and shortcomings of our approach to teach children research skills. It was a useful exercise where all involved learned: the students, the researchers, and the teacher. This can be extrapolated to benefits for the wider science community and society as a whole (Table 2), an argument supported by Coad and Evans (2008) who see the prioritisation of children's agendas in policy and practice among the benefits.

Table 2: Benefits of sharing social research in schools

Students/ teachers	Science community	Society
• Better understanding of social science methods, use, limitations • Have fun, learn across subject areas • Critical thinking • Opportunity to take ownership of results	• Insights in under-researched group (children) • Confidence to produce relevant science	• Relevant science • 'Grounded' scientists • Students that enjoy learning, questioning • Engaged students/ citizens

By teaching children the skills to research what is important to them, investigate issues and critically reflect on the results we allow them to think in the broader context. Working on translating data into charts supports the visualisation of results, links numbers and pictures, and allows for creativity. We believe this is a form of sustainable learning, drawing on Confucius' insight that when people are involved in something, they will understand it better. After the session, children expressed their satisfaction with this different approach to learning.

The ultimate purpose of this paper was to encourage other researchers to interact with children (if appropriate in schools), in order to improve the link between research and 'the real world'. It is of advantage if the researcher is comfortable in interacting with primary school pupils. It helps to identify a subject that overlaps with the researcher's expertise, the children's interest and, at best, the curriculum. Ethical considerations are important in any research project, but even more so when working with children and in schools.

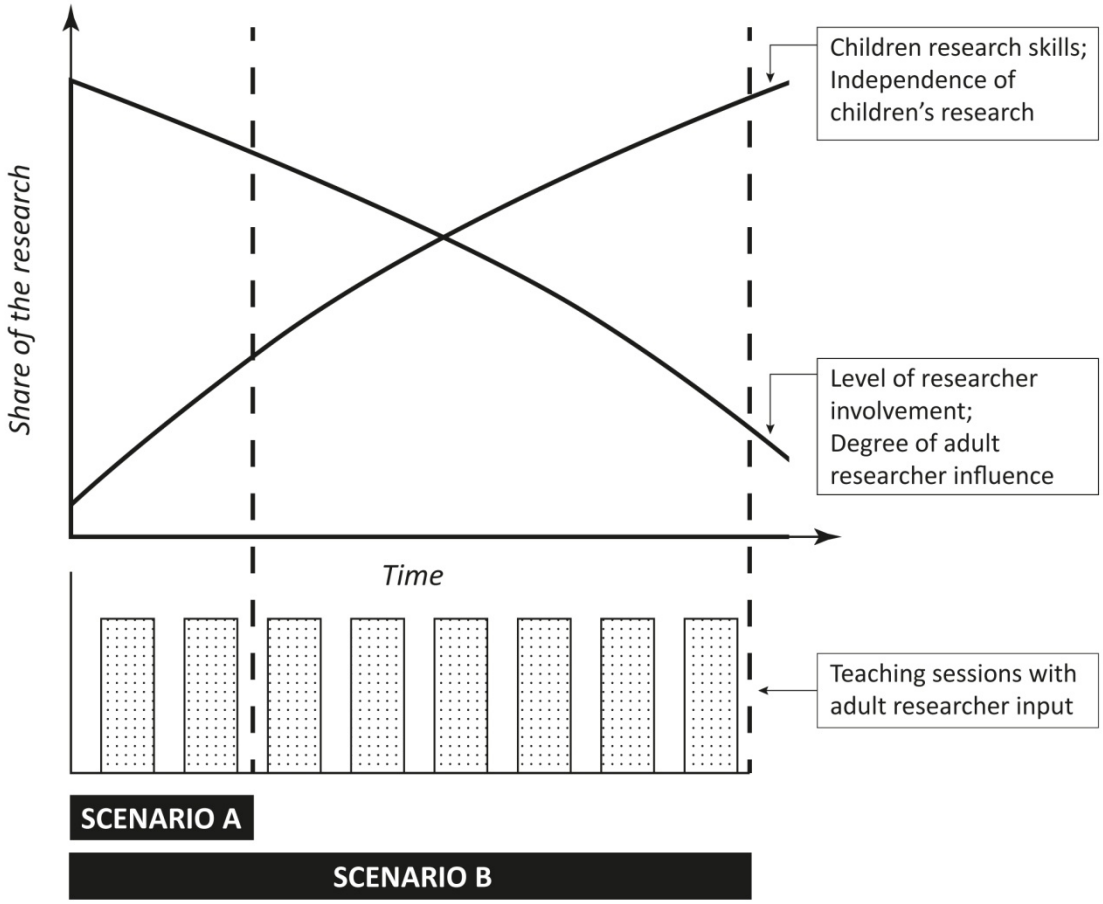
In addition to these more general conclusions, there are a few points we want to highlight. There is an unavoidable trade-off between data quality/quantity on the chosen subject and the learning experience for the students as these are two diverging aims. Our approach can be optimised for one but would then require compromises on the other e.g. allowing students to learn from their mistakes comes at the expense of an incomplete or flawed dataset, or the researcher might feel the students chose to investigate the 'wrong' research questions altogether. Research done by children is not more or less valid than adult research but will likely ask different questions. Even if the same research questions are asked, it is likely to arrive at different results. Adults should be aware that research on or with children will not generate the same results as genuine research by children. Research by adults and research with and by children should complement each other.

The more time can be allowed the better the learning experience and the research results. Due to commitments by the researcher, teacher and students, the time invested is likely to be restricted. Issues around time and resources were also highlighted by Coad and Evans (2008). Children's research skills and thus the level of independence with which they can carry out their research will increase if enough time can be made available to teach them the necessary skills. This cannot be achieved fully in a couple of sessions (our two visits lasting about 150 min each) but would require a more extensive teaching programme. Figure 5 illustrates the regular input from the researcher via teaching sessions (lower timeline). The share that the adult researcher has in the research undertaken is higher in the beginning and reduces over time as children gain skills. Our example is depicted by Scenario A where input stopped after one or two sessions. If only a few teaching sessions can be offered children gain less skills, with their research less independent and more influenced by the adult researcher. In Scenario B teaching session continue for a period of several weeks. With more time invested into teaching research skills the more independent the children's research becomes because their research skills are developed further. Results from the latter type of research are less influenced by adult researchers' thinking and more genuinely a product of children researching.

Ultimately, there will be a trade-off between what would be the ideal time allocation for the research endeavour and supervision and the time available under the restrictions outlined above. This will require the focus to be placed on what the three parties (students, teacher, researcher)

agree to be their main interest or focus. However, it may also be agreed just between teacher and researcher as they have the better overview of what students are capable of at a given point in their education and personal development, especially with regards to teaching them research skills (e.g. our students had not yet learned to convert absolute numbers into percentages as required to develop graphs).

Figure 5: Relationship between researcher input and independence of children's research



A further trade-off occurs between making the experience of learning research skills available to all pupils in a class and working only with a subgroup of more interested or more able students. The typical heterogeneity among a class of 33 students inevitably means that the instructions are too fast and non-comprehensible to some students, just right for a few, and too slow and repetitious for the very able students. Therefore, only a minority is receiving the optimal support. To avoid this, arrangements for selecting and working only with a subgroup can be made. We found this to be difficult because an additional teacher would have been required to supervise the small group while the researcher is working with them. Working with a subgroup after school requires parental permission, organising pick up and poses other logistical challenges.

Although doing research with children outside the school environment may have benefits, there are some clear advantages of organising the teaching of research skills (and conducting some of the research) in school. These include the availability of the necessary material and equipment which

saves time and effort for the researcher; children are supervised by their teacher at all times, eliminating the need for paperwork relating to risk assessment, disclosure, parent consent; and if the children decide to undertake research on their peers they are already familiar with them, age groups are more easily identifiable and accessible.

We conclude that it is well worth their time for researchers to interact with schools and endeavour to teach children research skills, and we would like to see more researchers to embark on this learning experience. We hope that sharing our ideas for how research methods can be taught to children within a school context will encourage other researchers to follow suit. Ultimately, the researcher will learn just as much about interacting with and educating children as the children learn about research, and both parties will be enabled to reflect on their relationship with their natural environment and their role within it.

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